Approved By

Incident Commander: Long, David David Long

Incident Action Plan

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Incident Name: 2018 Superior Refinery Fire | Period: Period 11 [05/23/18 06:00 - 05/30/18 06:00]

Present Conditions

Weather Conditions as of 05/22/2018 15:18

superior, wi us station id: MID_KSUW

Humidity (%):	47	***Pressure:***	29.97 psi
Wind Speed:	12 mph	***Dew Point:***	56
Wind Direction (from):	W	***Feels Like:***	78
Temperature:	78 Fahrenheit	***UV Index:***	
Visibility:	10 mile(s)		

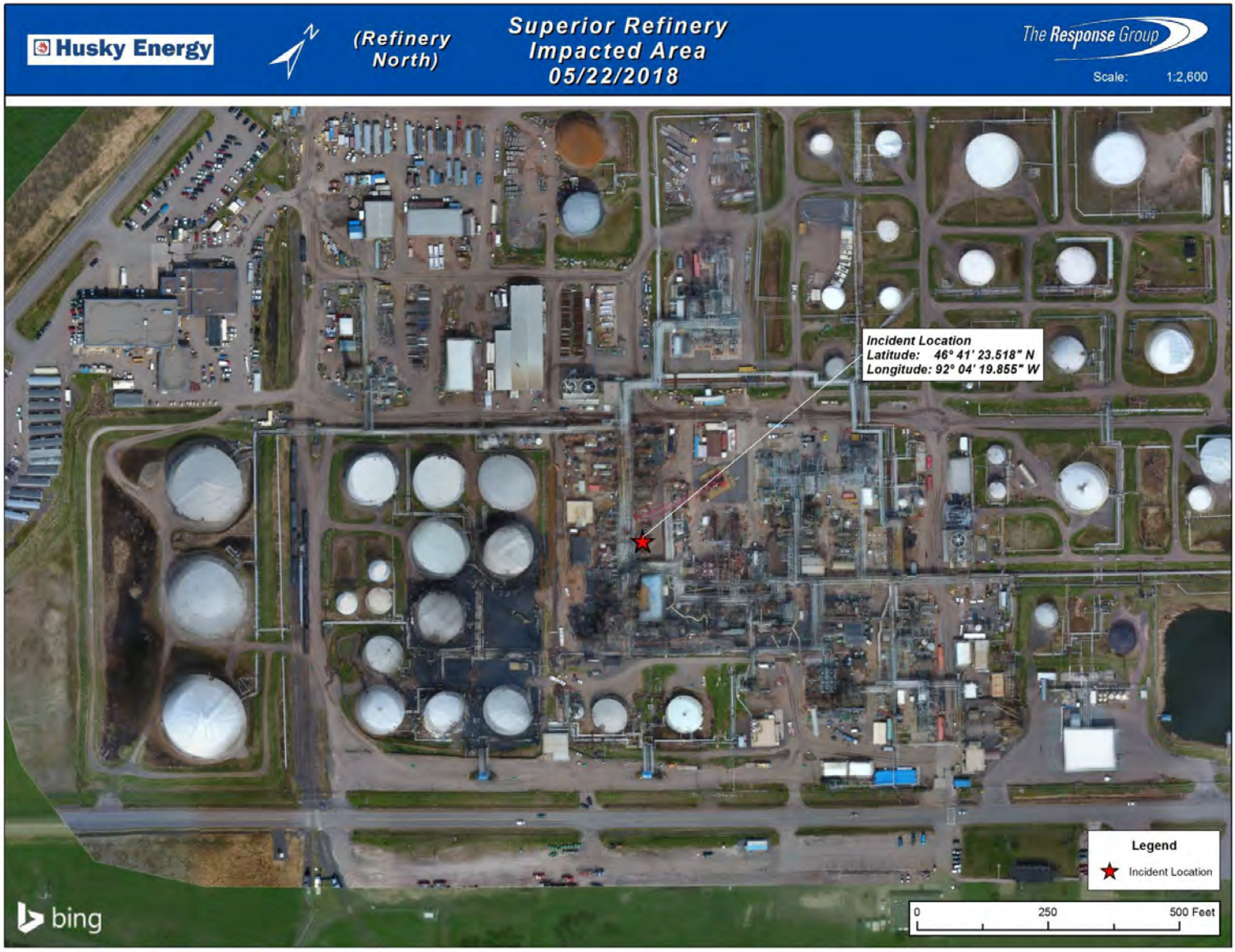
Cloudy

Forecast Date	*Wind*	*Temp High/Low*	*% Precip*	*Sunrise/ Sunset*	*Notes*
Tue 05/22/2018	5 mph SW	49 F	10		Partly cloudy, with a low around 49. Southwest wind around 5 mph.
Wed 05/23/2018	5 mph E	75 F	10		Sunny, with a high near 75. Light and variable wind becoming east 5 to 10 mph in the morning.
	5 mph E	48 F	40		A chance of thunderstorms after 1am. Increasing clouds, with a low around 48. East wind 5 to 10 mph. Chance of precipitation is 40%.
Thu 05/24/2018	10 mph SE	74 F	20		A slight chance of thunderstorms. Partly sunny, with a high near 74. East wind 5 to 10 mph becoming south in the afternoon. Winds could gust as high as 15 mph. Chance of precipitation is 20%.
	7 mph S	55 F	50		A chance of thunderstorms. Mostly cloudy, with a low around 55. South wind 5 to 10 mph. Chance of precipitation is 50%.
Fri 05/25/2018	8 mph SW	81 F	30		A chance of thunderstorms, mainly after 1pm. Partly sunny, with a high near 81. Chance of precipitation is 30%
	7 mph SW	53 F	20		Partly cloudy, with a low around 53.

Tides

Incident Map/Sketch

20180522_Impacted Area

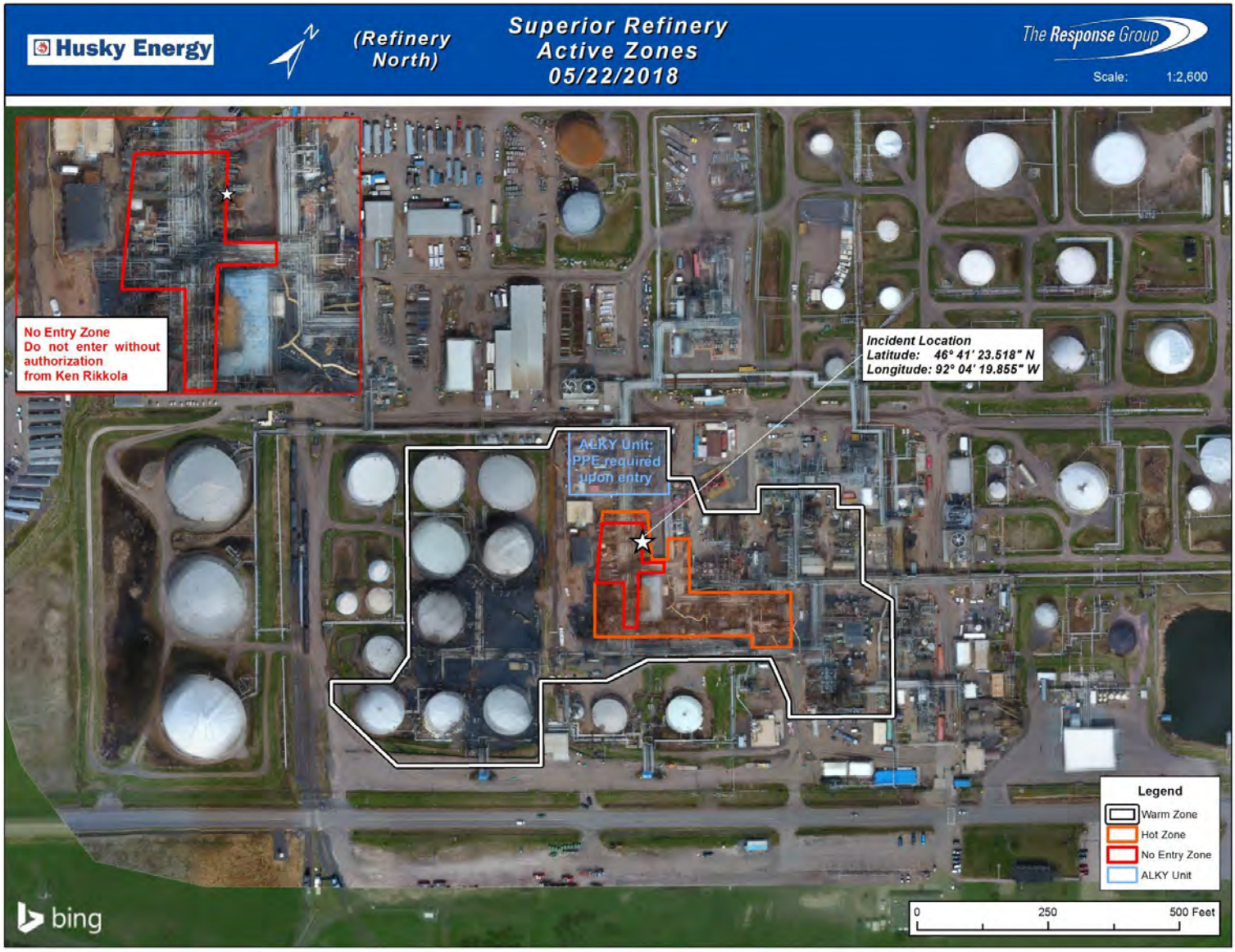


Incident Map/Sketch

20180521_Processing Plant Imagery

Incident Map/Sketch

20180522_Active Zones Map



Incident Map/Sketch

20180522_Map for Crane Operations

Objective(s)
Ensure the Safety of the public and Refinery Personnel
Incident stabilization
Evidence Preservation
Minimize environmental impacts
Keep Stakeholders Informed of Response Activities
Monitor social and local media

Operational Period Command Emphasis (Safety Message, Priorities, Key Decisions/Directions)

Limitations and Constraints

- Weather Conditions
- Night Operations (Limited)
- Limited Utilities (Electricity, Instrumentation, Air, Steam, WWTP, sewer system)
- Spilled Material Characteristics (monitoring/PPE requirements)
- Public Health Concerns
- Community/Media Perception
- Evidence Preservation / accessibility
- Work/rest Rotation Requirements
- Disposal of Waste
- Extent of damage
- Site access & hazards
- Site congestion / SIMOps

Key Decisions

- IC - Husky
- Name of Incident = 2018 Superior Refinery Fire
- Overall Response Organization - Staffing (C&G Staff filled by Husky)?

(*Note: Section chiefs have full authority on filling positions however make sure that agencies are integrated into the organization)*

- Command Post – Superior City Center (1409 Hammond Ave, Superior, WI 54880)
- Operational Period & work hours - 7 days (5/23/18 0600hr - 5/30/18 0600hr)
- Maintanance will go to 2 shifts of 10hrs each [Sunday Critical Path items only]
- All external releases of information should be approved by ICS
- Safe work plans associated with Critical activities
- Incorporate select task forces into regular operations

Procedures

- Resource Requests / Ordering Procedures (213RR Process) / Demob 221
- Documentation Process & Guidelines
- Claims Process (1-855-527-5002)

Incident Action Plan Components			
[x]	IAP Cover Sheet	[x]	Weather Report
[x]	Map/Sketch	[x]	ICS 202 - Incident Objectives
[x]	ICS 202b - Critical Information Requirements	[x]	ICS 204 - Assignment List
[x]	ICS 205 - Radio Communications	[x]	ICS 205a - Communications List

x	ICS 206 - Medical Plan	x	ICS 207 - Organization Chart
x	ICS 208 - Site Safety Plan	x	Main Column Overhead Receiver De-Inventory Plan
x	Waste Management Plan (Amended)	x	Community Air Monitoring Reduction Plan
x	Community Soot Assessment Work Plan		

Incident Command - Critical Threshold Reporting Criteria

**** If any of these conditions are met, Incident Commander must be notified immediately ****

- Injury or Death (OSHA/1st Aid or greater through Safety Officer)
- Significant change of status of site conditions
- Public health impacts
- Impacted sensitive areas beyond protection/Any change to trajectories
- Loss of major tactical resources
- Unplanned VIP visits en-route/planning/arriving
- Adverse protest plans or interview requests
- Adverse political/influence
- Loss or breach of containment
- Any breach in safety/investigation zone
- Special requests from agencies
- Any changes to respiratory requirements (eg: SCBA)
- Any evidence of wildlife impact
- Any exceedance of an air monitoring action level

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Stabilization Group Supervisor	Thom, Tim	Husky Energy Inc.	715-817-8016	
De-Inventory Task Force	Laszewski, Aaron	Husky Energy Inc.	920-883-1992	
De-Inventory Task Force	Ivanca, Erin	Husky Energy Inc.	651-592-6339	
De-Inventory Task Force	Campbell, Adam	Husky Energy Inc.	218-491-4920	
De-Inventory Task Force Leader	Witherill, Troy	Husky Energy Inc.	218-522-0114	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
De-Inventory Task Force	Manpower: Responder	Day Shift Responders	2	
De-Inventory Task Force	Manpower: Responder	Engineer	7	
De-Inventory Task Force	Manpower: Responder	Project Manager	1	
De-Inventory Task Force	Manpower: Responder	Project Control	1	
De-Inventory Task Force	Equipment: Safety	VCU	2	
De-Inventory Task Force	Manpower: Responder	Contractors	29	

Assignments

De-inventory the following units as per approved plan:
- Platformer
- High pressure receiver and condensers
- Propane treater and sand filter
- ISOM

Continue to develop the hydrocarbon de-inventory plans for priority assets:
- FCC Gas con stripper & debutanizer
- ISOM
- #2 Hydrobon
- #2 DUF
- North Crude
- High pressure receiver and condensers
- Propane treater and sand filter
- C3/C4 merox and amine contactor

SRS/Evergreen to assist with plan development.

De-Inventory fuel products upon completion of pipeline control system activation.

Develop plan to tie in natural gas to asphalt tank farm.

No operations on additional units until final approvals have been completed

Hydrocarbon de-inventory plan for each unit will be approved by the following:
- Incident Commander
- Operations Section Chief
- Planning Section Chief
- Environmental Unit Leader
- Safety Officer
- Lead Investigator

Communications

Name / Function	***Contact Details***
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Prior to commencing de-inventory activities, notify GHD so task specific monitoring can commence to verify site and public safety. Once de-inventory events commence, notification of any venting/release of vapor/liquid hydrocarbon to the environment shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Special Site-Specific Safety Considerations

Refer to individual De-inventory safety plans for additional requirements.

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Ensure that air monitoring, including 4-Gas and product specific (Benzene, Hydrogen Sulfide, etc.) is done during the de-inventory process.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the hazards of Nitrogen, unit contents including Benzene, H2S, petroleum products, etc.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Stabilization Group Supervisor	Thom, Tim	Husky Energy Inc.	715-817-8016	
Chemical Removal Task Force Leader	McCusker, Brian	Husky Energy Inc.	218-348-9769	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Chemical Removal Task Force	Manpower: Responder	Day Shift Responders	4	
Chemical Removal Task Force	Manpower: Responder	Night Shift Responders	7	

Assignments

Operations will:
- Continue HF air monitoring.
- Maintain deluge system around HF tank.
- Implement assignments per the store in place bow tie action tracker.
- Complete bow-tie risk analysis for neutralizing on-site.
- Identify damaged cylinders.

No additional operations until final approvals have been received

Four (4) options continue to be developed in parallel by HF Alkylation Consultants and SPSI in order to evaluate and mitigate risk:
1) Neutralize on-site
2) Transfer to an off-site facility
3) Retain on-site with safeguards in place
4) Other safe management alternatives

Communications

Name / Function	*Contact Details*
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

All precautions should be taken to minimize release of any chemical to the environment. If chemical is released the environmental unit leader shall be notified immediately.Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.
Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Any liquid hydrocarbon release shall be cleaned up immediately.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

In Alky Unit, fixed HF air monitors do not currently work. Rely on personal HF monitors and area monitors for determination of HF within the air.

In Alky Unit, the HF Mitigation System can now be operated from the FCC Control Room. Immediately contact the FCCU Control Room if portable air monitors alarm or if an HF leak is observed.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the products being handled including hydrofluoric acid and other hazards of the Alkylation Unit.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Stabilization Group Supervisor	Thom, Tim	Husky Energy Inc.	715-817-8016	
Steam Task Force Leader	Amato, Joe	Husky Energy Inc.	715-969-7724	
Steam Task Force Leader	Smith, Doug	Nexus Engineering	419-346-5987	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Steam Task Force	Manpower: Responder	Day Shift Responders	3	
Steam Task Force	Manpower: Responder	Engineer	1	
Steam Task Force	Manpower: Responder	Project Manager	1	

Assignments

Develop plan to re-instate steam on site to enable long term preservation of assets. Plan to include evaluation of bring on site package boiler and associated permits.

Identify safe isolation and tie in points for packaged boiler.

Implement steam re-instatement as per approved plan.

Finalized Plan to be reviewed and approved by:
- Operations Section Chief
- Planning Section chief
- Safety Officer
- Environmental Unit Lead
- Incident Commander

No operations to proceed prior to approval and permits in place

Special Environmental Considerations

If temporary boiler is needed a permit/exemption letter from the WDNR will need to be obtained prior to bringing it on-site.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

When working along the refinery perimeter, be cognizant of slip, trip and fall hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Stabilization Group Supervisor	Thom, Tim	Husky Energy Inc.	715-817-8016	
Pyrophoric Task Force Leader	McCusker, Brian	Husky Energy Inc.	218-348-9769	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Pyrophoric Task Force	Foreman	Foreman	2	

Assignments

Identify the high-risk areas for iron sulfide and mitigation measures.

Install nitrogen blanket on crude unit main fractionator.

Maintain nitrogen blankets on:
- FCCU Main column
- SRU / TGTU

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Be cognizant of the hazards of the products being handled.

If working along the permiter fence or other Husky property outside of refinery, contact security guards at 715-398-8220 to make them aware of your presence. Otherwise, the police will be called.

When working along the refinery perimeter, be cognizant of slip, trip and fall hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

Be sure to wear a life jacket when working over water. Life jackets are available in the Warehouse.

Inspect for ticks when traveling in grassy or wooded areas.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Mechanical Group Supervisor	Rikkola, Ken	Husky Energy Inc.	218-343-9538	
Energy Restoration Task Force Leader	Carlson, Brad	Husky Energy Inc.	218-390-5182	
Energy Restoration Task Force Leader	Massie, Nik	Husky Energy Inc.	715-817-1209	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Energy Restoration Task Force	Manpower: Responder	Electricians	10	
Energy Restoration Task Force	Supervisor	Supervisor	2	

Assignments

1) Submit plan for energizing the following areas:
- Plan to provide permanent power to VV building.
- T building
- Electrical plan to De-Inventory crude.
- Plan to secure I building TAP.
- M Building
- Rail yard lights

2). Energize the following areas:
- VV building.
- T building
- De-Inventory crude unit.
- Securing I building TAP.
- Marketing loading dock lighting
- M Building
- Rail yard lights

3) Disconnect high voltage to hot zone per the approved plan.

Prioritization changes to plans need to be approved by Operations Section Chief

Plans to be approved through normal refinery MOC process, Operations Section Chief and Incident Investigation Team (Shane Strang)

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Considerations of potential hydrocarbon release should be made prior to energizing hydrocarbon containing equipment or their control system in order to minimize the release of hydrocarbons.

Prior to energizing any CEM buildings all building analyzers and sampling equipment shall be turned off.

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Any liquid hydrocarbon release shall be cleaned up immediately.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Follow Refinery Electrical Safety and Lockout Tagout programs.

Be aware of your sorroundings. There may be large equipment and overhead work in your area.

Be cognizant of downed power lines, overhead hazards and potential for unintentional energization of electrical equipment.

Wear PPE appropriate to the potential electrical energy.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Mechanical Group Supervisor	Rikkola, Ken	Husky Energy Inc.	218-343-9538	
Control System Task Force Leader	Johnson, Joe	Husky Energy Inc.	651-307-7833	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Control System Task Force	Manpower: Responder	Electricians	1	
Control System Task Force	Manpower: Responder	Manpower: Responder	5	

Assignments

Install fiber cable to connect new crude control room to “T” building – to support DCS connection when it is available.

Restore BOHO DeltaV DCS control, with approval from Investigation Task Force.

Restore Pipeline Leak Detection and Spill Mitigation System.

Restore LPG Bullet Area Monitors and Remote Deluge System.

Energize PLC for Deluge Fire pump to enable pressure activation.

Verify instrumentation wiring status on the following areas:
- Flare
- Cooling water
- Fuel gas
- Steam
- Instrument air
- SRU
- Crude unit
- Platformer
- TGTU
- #2 Hydrobon

Special Environmental Considerations

Ensure that HF Air Monitoring is intergrated with GHD program.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the products being handled including hydrofluoric acid and other hazards of the Alkylation Unit.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

ICS 204 - Assignment List	Task Force: Asset Stabilization Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Mechanical Group Supervisor	Rikkola, Ken	Husky Energy Inc.	218-343-9538	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Asset Stabilization Task Force	Manpower: Responder	Manpower: Responder	16	
Asset Stabilization Task Force	Manpower: Operator	Manpower: Operator	2	
Asset Stabilization Task Force	Equipment: Heavy	Crane	2	

Assignments

Primary asset of concern for asset stabilization: Stripper tower (15G-V10)

Actions for stripper tower stabilization:
- 3D scan.
- Submit cut plan.

Continue identifying other assets of concern including building integrity issues.

Finalized Plan to be reviewed & approved by:
- Operations Section Chief
- Planning Section Chief
- Safety Officer
- Environmental Unit Lead
- Investigation Lead
- Incident Commander

No Operations to Proceed Prior to Plan Approval

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Once stabilization events commence, notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Actions shall be taken to minimize any release of hydrocarbons to the environment.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

All contractors must be preapproved by Refinery Safety Department.

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the product in the vessel, fire and similar hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request ligth plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

20180522_Map for Crane Operations

ICS 204 - Assignment List	Task Force: Asphalt Removal Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Mechanical Group Supervisor	Rikkola, Ken	Husky Energy Inc.	218-343-9538	
Asphalt Removal Task Force Leader	Stokes, Dave	Stack Brothers Mechanical	218-221-6427	
Asphalt Removal Task Force Leader	Linge, Jeremy	Husky Energy Inc.		

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Asphalt / Asbestos Removal Task Force	Manpower: Responder	Manpower: Responder	16	
Asphalt / Asbestos Removal Task Force	Front-end loader	Front-end loader	2	
Asphalt / Asbestos Removal Task Force	Manpower: Operator	Manpower: Operator	4	
Asphalt / Asbestos Removal Task Force	Roll Off Box	Roll Off Box	12	
Asphalt / Asbestos Removal Task Force	Vehicle	Roll Off Truck	2	
Asphalt / Asbestos Removal Task Force	Trackhoe	Trackhoe	1	
Asphalt / Asbestos Removal Task Force	Backhoe	Backhoe	1	
Asphalt / Asbestos Removal Task Force	Skid Steer	Skid Steer	1	
Asphalt / Asbestos Removal Task Force	Equipment: Heavy	Font-end Loader	2	

Assignments

Remove asphalt in priority areas as directed by operations and approved by Baker Risk.

Provide access to facility components through asbestos containment and/or removal.

Presumed asbestos containing material removal will be done by certified asbestos workers.

Asbestos workers will implement “Asbestos Remediation Plan 2018 Superior Refinery Fire” that GHD produced.

Aerial mapping of progress is completed twice weekly. Updated maps will be provided by OSC.

Prioritize the removal areas on a map per operations.

Baker Risk needed for documentation and storage of evidence found

Special Environmental Considerations

Follow existing waste management plan and approved by applicable agencies. Actions shall be taken to minimize any release of hydrocarbons to the environment. Any hydrocarbon release shall be cleaned up immediately and disposed of properly. Notification of any hydrocarbon release shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Any disturbance of Presumed Asbestos Containing Materials must be done by asbestos licensed personnel.

Be cognizant of the hazards of the areas that you are working in. Certain areas, such as the HF Unit, may require additional PPE.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Mechanical Group Supervisor	Rikkola, Ken	Husky Energy Inc.	218-343-9538	
Inspection Task Force Leader	Debevc, Ed	Husky Energy Inc.	250-961-2357	
Inspection Task Force Leader	Johnston, Gary	Husky Energy Inc.	715-817-1131	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Inspection Task Force	Manpower: Responder	Manpower: Responder	10	

Assignments

1) Primary focus on the Crude Vac unit addressing the following areas.

Engineering Drawings
- Assemble engineering package
- Assemble database and baseline information

2) Work ahead of De-Inventory assignments to conduct visual assessment of additional equipment outside the known event areas.
- Inspect the asphalt tank farm for de-inventory.
- Complete a visual impact assessment on ALKY unit.
- Complete monthly inspection of ALKY fresh acid storage tank.

3) Perform mechanical integrity analysis on structures identified by the Investigation Task Force.

4) Stress engineering to asses FCC main stack, NAPTHA splitter and main column.

Plan to be approved by Safety Officer, Operations Section Chief, Investigation Task Force Leader, Planning Section Chief and Incident Commander

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the product in reactor as well as nitrogen, fire and similar hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Emergency Response Group Supervisor	Quimby, Jerome	Husky Energy Inc.	218-428-5190	
ERT Task Force Leader	Lozon, Mark	Husky Energy Inc.	218-590-8298	
ERT Task Force Leader	VanHornweder, Brian	Husky Energy Inc.	218-428-5210	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
ERT Task Force	Fire Fighting Foam	Fire Fighting Foam	1500	
ERT Task Force	Tanker Truck	Tanker Truck	1	
ERT Task Force	Foam pumper	Foam pumper	1	
ERT Task Force	Manpower: Responder	Manpower: Responder	20	

Assignments

Maintain 24hr readiness to respond to any incidents on-site. Follow guidelines as defined in existing Superior Refinery Emergency Response Plan.

Deploy and maintain fire response to support de-inventorying, investigation and inspection activities.

See attached map for warm and hot zone locations.

ERT will ensure serviceability and organization of ERT building and equipment.

Communications

Name / Function	*Contact Details*
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

20180522_Active Zones

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Emergency Response Group Supervisor	Quimby, Jerome	Husky Energy Inc.	218-428-5190	
Fire Pump Task Force Leader	Peterson, John	Husky Energy Inc.	218-428-6160	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Fire Pump Task Force	Manpower: Responder	Manpower: Responder	3	
Fire Pump Task Force	Pumps	Fire Pumps	3	

Assignments

Maintain operational readiness of fire water pumps. Report any issues to the Emergency Response Group Supervisor.

Communications

Name / Function	*Contact Details*
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Release of diesel fuel at the diesel fire water pumps shall be properly cleaned up immediately for proper disposal.Actions shall be taken to minimize any release of hydrocarbons to the environment.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots.

If in Diesel Pump building and pumps are running, hearing protection must be worn.

If working along the pond perimeter, a life jacket must be worn.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Security Task Force Leader	Brager, Lynn	Securitas	715-398-8220	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Security Task Force	Manpower: Responder	Manpower: Responder	18	
Security Task Force	Vehicle	Security Vehicle	4	

Assignments

Securitas to maintain 24hr security checkpoints at command post and control sites. Roving security to patrol between sites and to additional locations as requested.

Security to reference list of (Non-Husky) individuals approved for access.

Maintain temporary road blocks as directed by SOFR.

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Immediate notification of a breach in the security of the site should be reported through the ICS system to mitigate the potential for a release of hydrocarbon to the environment.Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.
Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Any liquid hydrocarbon release shall be cleaned up immediately.

Special Site-Specific Safety Considerations

Any work on roadways requires a high visibility vest.

Be cognizant of vehicle traffic.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

Park Vehicle for roadblocks so that your on not in oncoming traffics lane. If someone is not paying attention, they could potentially not notice the roadblock. Keep truck flashing lights on if manning roadblocks.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Decon Task Force Leader	Raiha, John	Husky Energy Inc.	218-390-4078	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Decon Task Force	Manpower: Responder	Manpower: Responder	4	
Decon Task Force	Miscellaneous	Decon Station	3	

Assignments

Conduct personnel decon for those exiting the hot zone or other designated area that requires Decon per standard procedure.

Decon stations are at;
- #1 Cooling tower
- West of flare
- ALKY (Specifically for work inside ALKY unit, decontamination for ALKY chemical gear)

Asbestos decontamination facilities will be provided by the Asbestos contractor.

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.
Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Any liquid hydrocarbon release shall be cleaned up immediately.

Special Site-Specific Safety Considerations

Decon personnel must wear chemical gear over FR coveralls.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

Four station boot Decon:
1. Simple Green and/or Orange Peel used to decon at Wash Station #1
2. Water rinse at station #2
3. Water rinse at station #3
4. Clean water tub at station #4

Asbestos Decon will be overseen by asbestos removal contractors.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Investigation Task Force	Shtand, Wally	Husky Energy Inc.	403 512-1437	
Investigation Task Force	Demchuk, Bill	Husky Energy Inc.	403 702-5724	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Investigation Task Force	Manpower: Responder	Manpower: Responder	18	

Assignments

Continue the DCS data replication:
- Yokogawa DCS
- Net DAHS

Continue to support evidence collection as prioritized by operations.

Baker Risk working on clearing asphalt removal on affected areas.

Develop plan for walk down.

Secure evidence storage:
- Confirm Location
- Choose installation vendor

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the product in reactor as well as nitrogen, fire and similar hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information
If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
Air Monitoring Task Force Leader	Armes, Will	GHD	519-497-8054	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Air Monitoring Task Force	Equipment: Air Monitoring	AreaRaes	32	
Air Monitoring Task Force	Equipment: Air Monitoring	MultiRaes	10	
Air Monitoring Task Force	Equipment: Air Monitoring	UltraRaes	10	
Air Monitoring Task Force	Equipment: Air Monitoring	Dust Track	10	
Air Monitoring Task Force	Manpower: Operator	Air Monitoring Supervisors	2	
Air Monitoring Task Force	Manpower: Responder	Industrial Hygienist	25	
Air Monitoring Task Force	Manpower: Responder	Asbestos Contractors	1	

Assignments

1. Continue to maintain a fixed perimeter air monitoring system that has been deployed to the area currently delineated as the hot zone. This monitoring will be conducted in accordance with the Site action levels described in the Air Monitoring Plan

2. Continue to maintain a fixed perimeter air monitoring system that has deployed to the perimeter of the refinery process area at or near the fence line. This monitoring will be used to provide information regarding air quality in close proximity to potential sources of emissions of COI during the cleanup and recovery phases of the project.

3. Mobile community monitoring teams will continue to conduct monitoring in the area outside the facility, with a focus on downwind monitoring, while the cleanup and recovery phases of the project are ongoing.

4. Mobile on site teams will continue to conduct monitoring during De-Inventory activities.

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.
Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

If working along the perimeter fence or other Husky property outside of refinery, contact security guards at 715-398-8220 to make them aware of your presence. Otherwise, the police will be called.

When working along the refinery perimeter, be cognizant of slip, trip and fall hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

When leaving vegetated areas outside of refinery, visually inspect clothing and skin for ticks.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

20180521_Air Monitoring

ICS 204 - Assignment List	Task Force: Water Sampling Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
Water Sampling Task Force Leader	Turner, Matt	Husky Energy Inc.	715-969-4873	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Water Sampling Task Force	Miscellaneous	Long-Handled Surface water Sampler	4	
Water Sampling Task Force	Miscellaneous	Lab Sample Containers	24	
Water Sampling Task Force	Miscellaneous	Water-Proof Shipping Containers	4	
Water Sampling Task Force	Manpower: Responder	Water Sampling Techs	3	

Assignments

Water sampling to be conducted once per week as directed by the Water Sampling Task Force Leader. When sampling occurs, the following will take place:

1. Continue to collect water samples at designated sites utilizing appropriate water sampling equipment and techniques.

2. Sample at Four (4) pre-determined locations off site

3. Package and arrange water samples for delivery to selected labs for analysis.

4. Report findings to EUL and GHD.

5. Conduct on-site sampling for PFAS as needed.

Communications

Name / Function	Contact Details
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Follow existing water sampling plan developed by GHD and approved by applicable agencies. All precautions should be taken to ensure proper sampling and handling. Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.
Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring. Any liquid hydrocarbon release shall be cleaned up immediately.

Special Site-Specific Safety Considerations

Please refer to GHD Health and Safety Plan for water sampling.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warrented, request ligth plants and other larger lighting.

Life jackets are required when working over water. Life jackets are available in the Warehouse.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

20180510_watersamplingsites_NoDate.jpg

ICS 204 - Assignment List	Task Force: IH Monitoring Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
IH Monitoring Task Force Supervisor	Jones, Jacob			

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
IH Monitoring Task Force	Manpower: Responder	Industrial Hygienist	6	
IH Monitoring Task Force	Pumps	Sampling Pumps	5	

Assignments

Continue asbestos monitoring on-site as directed by approved Asbestos Plan

Personal monitoring for air contaminants. (VOC, Asbestos)

Provide asbestos hazard support to ERT and on-site operations within the hot zone or other areas where insulation is damaged.

Communications

Name / Function	*Contact Details*
ERT Channel	8
Channel 1 Talk Around	11
Primary	1
Secondary	2
Radio	3 to 7

Special Environmental Considerations

Debris shall be assumed to be asbestos containing unless testing or other means of identification confirms otherwise. Actions shall be taken to minimize any release of presumed asbestos containing materials (PACM) to the environment. Any PACM disturbance/release/exposure shall be mitigated or cleaned up immediately and disposed of properly.
Notification of any PACM activites shall be made to the GHD IH air monitoring group immediately for evaluation, mitigation and/or exclusion.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

If working along the perimeter fence or other Husky property outside of refinery, contact security guards at 715-398-8220 to make them aware of your presence. Otherwise, the police will be called.

When in the refinery, be cognizant of hazards associated with a fire zone.

When working along the refinery perimeter, be cognizant of slip, trip and fall hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

ICS 204 - Assignment List	Task Force: Environmental Support Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
Environmental Support Task Force Leader	Turner, Matt	Husky Energy Inc.	715-969-4873	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Environmental Support Task Force	Manpower: Responder	Manpower: Responder	3	
Environmental Support Task Force	Boom	Boom	400	
Environmental Support Task Force	Sorbent: Boom	Sorbent: Boom	400	
Environmental Support Task Force	Vehicle	Vehicle	4	
Environmental Support Task Force	Vacuum Truck	Vacuum Truck	1	
Environmental Support Task Force	Manpower: Operator	Vac Truck Operators	2	
Environmental Support Task Force	Manpower: Operator	Operator	1	
Environmental Support Task Force	Excavator	Mini Excavator	1	

Assignments

Boom Maintenance:
The team will travel to the current boom sites along Newton Creek to assess the condition of the boom. The morning crew will replace all absorbent boom that appears to have petroleum contamination. Any containment boom that is compromised will be put into 55 gallon steel drums that are labeled with a non-hazardous waste label filled in with "Oily Absorbent Booms". Full drums will be brought to the 90 day storage building. Pictures of each boom site should be taken both before and after any upkeep for documentation. Report to acting shift foreman for any additional work he may have for them.

Respond to any immediate actions, environmental concerns. (ie: Cleanup of contaminants at boom locations, address contamination issues at stinson avenue) as directed by Environmental Support Task Force Leader.

Communications

Name / Function	Contact Details
Primary	1
Secondary	2
Radio	3 to 7
ERT Channel	8
Channel 1 Talk Around	11
Channel 2 Talk Around	12

Special Equipment / Supplies Needed for Assignment

Steel Drums, wheelbarrow

Special Environmental Considerations

Presence of sheen/oil at any location shall be relayed to the boom maintenance task force leader. Actions shall be taken to minimize any release of hydrocarbons to the environment. Any liquid hydrocarbon release shall be cleaned up immediately and disposed of properly.

Notification of any venting/release of vapor/liquid hydrocarbon shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Be aware of slipping hazards on sides of banks of creek and other areas.

When work involves roadways, utilize Hi Viz vest.

Wear a life jacket when working in areas of deeper water. Consider slipping hazards and what might happen if you were to slip into creek while deploying boom or into pond while sampling.

Be cognizant of the products being handled.

Utilize proper lifting techniques and utilize mechanical lifting techniques on heavy boom or other objects.

Inspect for ticks when traveling in grassy or wooded areas.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Asphalt Recovery and Boom Management Plan

Crew: 2 shifts, 2 workers each shift. Workers must have current HAZWOPER Training

Frequency: Twice per day (once per shift) for a week

Materials: Containment Boom (100ft)

Absorbent Boom (100ft)

55 gallon steel drums (4)

Non-Hazardous Waste Labels (4)

Shovels (2)

Wheelbarrow (1)

Pickup Truck (1)

Boom Location Map (1)

High Visibility Vest for Worker (2)

Objective: **Stinson Ave Ditch Asphalt Recovery:** Teams of two with current HAZWOPER training will travel along the northern side of Stinson Ave and collect any asphalt present. Asphalt may appear in "globs" with sizes ranging from a softball to a pea. Collected asphalt can be placed in a wheelbarrow while traversing Stinson Ave and ultimately transferred into 55 gallon steel drums. The drums are to be labeled with a non-hazardous waste sticker that is filled in with "Asphalt + Soil". Under no circumstances should any other material be collected as to not interfere with the incident investigation. Full drums will be brought to the 90 day storage building and properly stored. Pictures of gross asphalt contamination should be taken for documentation purposes.

Newton Creek Boom Maintenance: After conducting the asphalt recovery portion of the plan, the same team of two will travel to the current boom sites along Newton Creek to assess the condition of the booms. The morning crew will replace all the absorbent boom in the creek. The afternoon crew will replace any absorbent boom that appears to have petroleum contamination. Any containment boom that is compromised should be replaced or adjusted to ensure functionality. Spent absorbent booms will be put into 55 gallon steel drums that are labeled with a non-hazardous waste label that is filled in with "Oily Absorbent Booms". Full drums will be brought to the 90 day storage building and properly stored. Pictures of each boom site should be taken both before and after any upkeep for documentation purposes.

After Both Tasks Are Complete: Once the tasks have been completed, the team will then contact the acting shift foreman for any additional work he may have for them.

Operations Personnel

Position	*Name*	*Affiliation*	*Contact Number(s)*	*Work Shift*
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
Wildlife Task Force Leader	Battaglia, Chris	Focus Wildlife	310-386-5965	

Resources Required

Area Of Operation	*Resource Kind*	*Description*	*Quantity*	*Size*
Wildlife Task Force	Manpower: Responder	Manpower: Responder	3	

Assignments

Minimize access to asphalt tank farm by installing fencing (chain link & silt fence), continue to clean up and maintain pennant & mylar flagging around all of the asphalt and 6 oil containment area.

Implement Canadian goose nest and egg depredation as defined in the wildlife plan.

Implement active wildlife hazing as appropriate.

Continuous active monitoring of wildlife on-site and off-site around the facility

All operations should be in accordance with the approved Wildlife Plan.

Active wildlife rehabilitation.

Removing oil in concrete ditch and installing snow fence along the ditch.

Special Equipment / Supplies Needed for Assignment

100yd sand
Pre-sectioned mobile fencing
PFD
Flagging material

Special Environmental Considerations

Follow existing wildlife management plan and approved by applicable agencies. Actions shall be taken to minimize any impact to wildlife. Notification to the Wildlife Group and Environmenal Unit Leader of any identified impacts to wildlife (terestrial, aquatic, avian). Additionally, notification of any hydrocarbon release shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Be cognizant of the hazards of the products being handled.

If working along the permiter fence or other Husky property outside of refinery, contact security guards at 715-398-8220 to make them aware of your presence. Otherwise, the police will be called.

When working along the refinery perimeter, be cognizant of slip, trip and fall hazards.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Be sure to wear a life jacket when working over water. Life jackets are available in the Warehouse.

Inspect for ticks when traveling in grassy or wooded areas.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

ICS 204 - Assignment List	Task Force: Waste Management Task Force
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]

Operations Personnel

Position	Name	Affiliation	Contact Number(s)	Work Shift
Operations Section Chief	Fredman, Peter	Husky Energy Inc.	320-288-6161	
Deputy Operations Section Chief	Schade, Kollin	Husky Energy Inc.	317-292-6594	
Environmental Monitoring Group Supervisor	Beattie, Dave	Husky Energy Inc.	218-348-9051	
Waste Management Task Force Leader	Turner, Matt	Husky Energy Inc.	715-969-4873	

Resources Required

Area Of Operation	Resource Kind	Description	Quantity	Size
Waste Management Task Force	Manpower: Responder	Manpower: Responder	2	
Waste Management Task Force	Manpower: Operator	Operator	1	
Waste Management Task Force	Front-end loader	Front-end loader	1	

Assignments

Contingent on Baker Risk clearance on a per site basis:

Dispose of asphalt removed by the Asphalt Removal Task Force.

Movement of disposal equipment should be directed by Asphalt Removal Task Force Leader

All operations to follow the approved Asbestos and Waste Management Plans.

Special Environmental Considerations

Follow existing waste management plan and approved by applicable agencies. Actions shall be taken to minimize any release of hydrocarbons to the environment. Any hydrocarbon release shall be cleaned up immediately and disposed of properly. Notification of any hydrocarbon release shall be made to the GHD air monitoring group immediately for consideration in air monitoring.

Special Site-Specific Safety Considerations

If working in Hot or Warm Zone, must follow entry procedures.

Minimum PPE for work in refinery is full FR clothing, Hard Hat, Safety Glasses with side shields and safety boots. Additional PPE may be required depending on work to be performed or areas to be entered. Refer to Safe Work Permit and Safe Work Permit writers for further guidance.

A Safe Work Permit is required for all work. Safe Work Permits can be obtained from operators in the ERT Building.

Hazard assessment must be done to plan safe work.

Be cognizant of the hazards of the products being handled.

Use flashlights, vehicle lights and other lighting during nighttime activities. If warranted, request light plants and other larger lighting.

For work in asbestos (asbestos danger tape) areas of the hot zone or where damage has occurred to insulation or equipment outside of hot zone, area must be assessed for asbestos and other hazardous materials by an Industrial Hygienist from GHD. If concerns are found, GHD will work with asbestos removers to render the area safe for work if possible. Any concerns found as part of this assessment must be addressed prior to any work being done.

The Plant Emergency Alarm system will signal need to evacuate from the site. The plant radio system will be used to signal an evacuation if the primary should fail.

Be aware of the potential for severe weather. In the refinery, the Shift Foreman will make an announcement on the plant radio system if there are special precautions or if there is a need to take shelter.

Additional Information

If impacted wildlife are observed. Do not approach or attempt to capture. Please contact Husky Hill Avenue guard shack at 715-398-8220 or 221

Radio Channel Information

Ch #	*Function*	*Channel Name/ Trunked Radio System Talkgroup*	*Assignment*	*Rx Freq N or W*	*Rx Tone/NAC*	*Tx Freq N or W*	*Tx Tone/NAC*	*Mode (A, D, or M)*	*Remarks*
1	Primary	Primary Radio Channel - Repeated							
2	Secondary	Secondary Radio Channel - Repeated							Secondary Repeated Channel Unit and Use s
3 to 7	Radio	Radio to Radio Channels							Working Channel
8	ERT Channel	Emergency Response Channel							Emergency Response Team Channel
11	Channel 1 Talk Around	Channel 1 Talk Around							Use this channel in case of failure of repeated Channel 1
12	Channel 2 Talk Around	Channel 2 Talk Around							Use this channel in case of failure of repeated Channel 2

Special Radio Instructions

Local Communications Information

Name	*Incident Assigned Position*	*Mobile Phone*	*Work Phone*	*Email*	*Notes*
Goedde, Ed	Incident Commander	Non-Responsive		ed.goedde@huskyenergy.com	
Williams, Blake	Deputy Incident Commander		403 298-7443	blake.williams@huskyenergy.com	
Morrison, Dave	Agency Representative			morrison.david@epa.gov	
Gabert, Jeff	Public Information Officer				
Sheedy, Colin	Liaison Officer		403-298-6794	colin.a.sheedy@huskyenergy.com	
O'Brien, John	Safety Officer				
Syphard, Dan	Legal Officer				
Fredman, Peter	Operations Section Chief			peter.fredman@huskyenergy.com	
Schade, Kollin	Deputy Operations Section Chief				
Tokarz, Christina	Planning Section Chief			Christina.Tokarz@huskyenergy.com	
Choate, Jerry	Logistics Section Chief			jerry.choate@huskyenergy.com	
Oestreich, Scott (5/21)	Deputy Logistics Section Chief				
Oestreich, Scott	Deputy Logistics Section Chief (5/21)				
Kowitz, Kim	Finance Section Chief				
Verrill, John	Deputy Finance Section Chief				
Broadbent, Evan	Resource Unit Leader			ebroadbent@responsegroupinc.com	
Takahashi, Yoshimi	Documentation Unit Leader			Yoshimi.takahashi@huskyenergy.com	
Cooke, Lorelee	Documentation Unit Leader		403 298-6238	lorelee.cooke@huskyenergy.com	
Beattie, Dave	Environmental Unit Leader			dave.beattie@huskyenergy.com	
Gavalas, Judith	HR Officer				
Bachhuber, Julie	HR Officer			julie.bachhuber@huskyenergy.com	
Lozada, Rene	ICS Process Advisor		832-763-8541	rlozada@responsegroupinc.com	
Hill, Travis	GIS Specialist			thill@responsegroupinc.com	
Black, Jason	Supply Unit Leader			jason.black@huskyenergy.com	
Bruckelmyer, Jason	Support Branch Director				

Medical Aid Stations

Name	Location	Paramedic On Site	Phone	Radio
Superior Refinery Medical Aid Station	-92.07578 46.68889	x		

Transportation (Ground and/or Air Ambulance Services)

Ambulance Service	Location	Phone	Radio	Air	ALS
Global Air Ambulance	3500 Tower Ave. Superior, WI 54888 -92.07202 46.68952	Ph1: (305) 514-0942		x	
Gold Cross Ambulance Service	4505 W. Michigan St. Duluth, MN -92.15475 46.74444	Ph1: (218) 628-9323			

Hospitals

Hospital	Location	Phone	Radio	Air Travel Time	Ground Travel Time	Trauma Center	Helipad	Burn Center
Essentia Health St. Mary's Hospital	3500 Tower Ave Superior, MN -92.10236 46.69748	Ph1: (715) 817-7000		min	15 min	II	x	
Essentia Health Duluth (Miller Dwan) Thermal or Chemical Burns	502 E 2nd St Duluth, MN -92.09367 46.79244	Ph1: (218) 727-8762		min	30 min	II		x
St Luke's Duluth	915 East First Street Duluth, MN -92.08762 46.79718	Ph1: (218) 249-5555		min	30 min	II	x	
				min	min			

Special Medical Emergency Procedures

All injured employees who require more than in-house first aid, (i.e. lacerations requiring stitches, severe eye problems, severe strains/sprains or fractures) will be sent to the following medical facility:
Essentia St. Mary's Occupational Medicine Clinic
3500 Tower Ave
Superior, WI
(715) 817-7100

INJURIES INVOLVING EXPOSURE TO HYDROFLUORIC ACID
For minor exposures, the employee may be transported to Essentia St. Mary's Emergency Room in Superior, the Essentia Duluth Clinic Occupational Medicine Clinic or the Essentia St. Mary's Hospital Emergency Room in Duluth.
For all but minor exposures, the employee should be transported by ambulance to:
St. Mary's Hospital Emergency Room in Duluth:
407 East 3rd Street
Duluth. MN
218-786-4000

INJURIES INVOLVING THERMAL OR CHEMICAL BURNS
For injuries involving all but minor thermal or chemical burns, employees should be transported by ambulance to:
Essentia Miller-Dwan Burn Center 502 E. Second St., First Floor
Duluth, MN
(218) 786-2815

MEDICAL SERVICES/EMPLOYEE MEDICAL RECORDS/ WORKER'S COMPENSATION

SCOPE

This Standard Practice Instructions is to be considered Husky Superior company policy and minimum acceptable standards under normal conditions. Stricter requirements may apply under certain situations. If a problem is encountered, consultation with a safety professional should be considered before proceeding. Keep in mind that any alternative procedure must be at least as effective as these instructions in providing a safe workplace.

RATIONALE

This procedure was developed to inform all supervisors of the steps which need to be taken to insure that all injured employees are properly cared for, to explain access to employee medical records, and to explain the worker's compensation procedure.

APPLICATION

This policy describes the procedure that needs to be followed by all Husky Superior employees when it is necessary to obtain medical services, access medical records, or receive worker's compensation.

DEFINITIONS

Minor injury – Any injury that can be properly attended with in-house first aid. This type of injury might include strains/sprains, lacerations not requiring stitches, irrigating eyes or minor burns (either chemical or thermal).

Medical First-Aid Injuries – Any injury that can be properly attended by a physician with first-aid treatment.

Serious Injury – An injury that resulted in an OSHA recordable injury, lost-time injury (either lost workdays or restricted workdays) or fatality.

PROCEDURE FOR OBTAINING MEDICAL SERVICES

Note: On-Shift Emergency Response Team (ERT) Members should be called to assist on all, but very minor, medical incidents.

DAYTIME HOURS, MONDAY THROUGH FRIDAY

All injured employees who require more than in-house first aid, (i.e. lacerations requiring stitches, severe eye problems, severe strains/sprains or fractures) will be sent to the following medical facility:

Essentia SMDC Occupational Medicine Clinic
Duluth Clinic 3rd Street Building
400 E. Third St.
Duluth, MN
(218) 786-3392

-or-

Essentia St. Mary's Occupational Medicine Clinic
3500 Tower Ave
Superior, WI
(715) 817-7100

A. The immediate supervisor shall contact the Safety Department and advise of the injured employee.

B. The Safety Manager or other member of the Safety Department will notify Essentia that an employee of Husky Superior is in route and give them a brief description of the employee's condition.

    a. If requested by the Employee's Supervisor, the medical facility will also be advised that a drug screen and breath alcohol test according to the Husky Superior Drug and Alcohol Program will be needed.

C. The Safety Manager, other member of the Safety Department or the Shift Foreman/Employee's Supervisor should accompany the injured employee to the medical facility to assure prompt and immediate medical attention is obtained. The medical facility will direct proper medical attention/treatment.

EVENINGS, WEEKENDS, HOLIDAYS

If an employee is injured Monday through Friday, after 5:00 PM, on a Saturday, Sunday, or holiday, the shift supervisor will follow these guidelines.

Minor Injuries

All injured employees who require more than in-house first aid, (i.e. lacerations requiring stitches, severe eye problems, severe strains/sprains or fractures) will be sent to the following medical facility:

Essentia St. Mary's Emergency Room
3500 Tower Ave
Superior, WI 54880
Phone: (715) 817-7100

Serious Injury

Some injuries may be such that immediate outside medical attention is required. If it has been determined that the injury is not life threatening but will require outside medical attention, the injured employee should be transported either by company vehicle or by ambulance. Unless directed by ambulance or other emergency responders, the employee should be transported to the Emergency Room at Essentia St. Mary's Superior or Duluth.

A. The immediate supervisor shall contact the Safety Department and advise of the injured employee.

B. The Supervisor or the Safety Manager will notify Essentia that an employee of Husky Superior is in route and give them a brief description of the employee's condition.

    a. If requested by the Employee's Supervisor, the medical facility will also be advised that a drug screen and breath alcohol test according to the Husky Superior Drug and Alcohol Program will be needed.

C. The Shift Foreman/Employee's Supervisor, Safety Manager/Safety Department Member or other Husky Superior Employee should accompany the injured employee to the medical facility to assure prompt and immediate medical attention is obtained. The medical facility will direct proper medical attention/treatment.

LIFE THREATENING EMERGENCIES

If the injury is life threatening, the injured employee will be transported to the hospital by ambulance. An injured employee under these conditions will not be transported by a Husky Superior or contractor employee. The supervisor in charge shall call or designate someone to call 911.

Examples of Life Threatening Situations

a. Employee is unconscious

b. Severe bleeding

c. Cyanosis (blue lips, fingernails)

d. Severe head injury

e. Severe chest pain, pain radiating down arms

f. Compound fractures (bones exposed)

g. Immediate excessive swelling

h. Hypothermia

i. Heatstroke

j. Stroke

Information for Operator at 911

a. Give a brief description of the problem. This will enable EMT's to prepare the equipment necessary for the immediate care of the injured employee.

b. Give direction to the appropriate gate nearest the accident; advise that there will be someone at the gate to escort the emergency vehicle to the site of the accident.

After the 911 call, contact the following:

a. Call security and advise them of the pending arrival of the emergency vehicle.

b. Call the Essentia Medical facility that the employee was transported too and advise them that an employee of Husky Superior is in route and give them a brief description of the employee's condition and require a post accident drug/alcohol screen.

c. Notify either the Safety Manager, on-call personnel (weekends/holidays), or any available member of management.

INJURIES INVOLVING EXPOSURE TO HYDROFLUORIC ACID

For minor exposures, the employee may be transported to Essentia St. Mary's Emergency Room in Superior, the Essentia Duluth Clinic Occupational Medicine Clinic or the Essentia St. Mary's Hospital Emergency Room in Duluth.

For all but minor exposures, the employee should be transported by ambulance to:

St. Mary's Hospital Emergency Room in Duluth:
407 East 3rd Street
Duluth. MN
218-786-4000

Follow notification and other procedures as outlined above depending on the time of day that the exposure occurs.

INJURIES INVOLVING THERMAL OR CHEMICAL BURNS

For injuries involving all but minor thermal or chemical burns, employees should be transported by ambulance to:

Essentia Miller-Dwan Burn Center
502 E. Second St., First Floor
Duluth, MN
(218) 786-2815

Follow notification and other procedures as outlined above depending on the time of day that the exposure occurs.

SUPERVISOR'S INCIDENT/INJURY REPORT

The immediate supervisor shall complete the Supervisor's Incident/Injury Report form as soon as possible after the occurrence, but no later than the end of the shift on which it occurred.

NOTE: Husky Superior is required to notify OSHA within 8-hours of any incident that results in a fatality or the hospitalization of three or more employees. This notification will result in an OSHA investigation of the incident.

ACCESS TO RECORDS

The following records shall be made available, upon request, to any employee and to their representatives for examination and copying at a reasonable time and manner:

a. OSHA 300 log;

b. Work Comp First Report of Injury;

c. OSHA 300A Annual Summary of occupational injuries and illnesses;

d. Pulmonary function and audiometric testing.

e. Industrial hygiene sampling records.

Medical records are kept in a confidential file, separate from the personnel file in the general administrative office. These files include the pre-placement physical record and worker's compensation information. Audio and pulmonary medical records are maintained in a separate file in the Safety Department. Employees may inspect their medical records by contacting the Supervisor of Administrative Services.

WORKER'S COMPENSATION

An employee involved in a personal injury has the responsibility to perform the following steps:

1. Receive medical attention if needed.
2. Report injury to supervision immediately!
3. Complete all appropriate forms with supervision.

   NOTE: These forms must be completed as soon as possible after the occurrence, but no later than at the end of the shift on which it occurred.

4. Participate in all investigations as necessary.

If an employee has an injury or illness that has not been reported as an accident but the employee believes it is work related, the employee must inform the company of the circumstance of the injury or illness and how it relates to the work place.

When the employee gives notice of an injury, the employee may see a physician of his/her choice. However, Husky Superior reserves the right to send the employee to another doctor for a second opinion at its discretion. In emergencies, Husky Superior may choose the practitioner without offering a choice, but after the emergency, the employee still has the option of seeing his/her own physician. The employee also may change practitioners once, with notice to Husky Superior.

The employee must provide Husky Superior with a doctor's report that provides evidence that the illness/injury is related to the employee workplace.

Clinic/Hospital Information

Minor Injuries - Daytime Hours, Monday through Friday (either):

Essentia SMDC Occupational Medicine Clinic
Duluth Clinic 3rd Street Building
400 E. Third St.
Duluth, MN
(218) 786-3392

Essentia St. Mary's Occupational Medicine Clinic
3500 Tower Ave
Superior, WI
(715) 817-7100

Minor Injuries - Evenings, Weekends or Holidays:

Essentia St. Mary's ER - Superior
3500 Tower Ave
Superior, WI 54880
(715) 817-7100

Serious Injuries

Unless directed by ambulance or other emergency responders, the employee should be transported to either:

Essentia St. Mary's ER - Superior
3500 Tower Ave
Superior, WI 54880
(715) 817-7100

Essential St. Mary's Hospital ER - Duluth:
407 East 3rd Street
Duluth. MN
218-786-4000

HF Minor Exposures (any of the following):

Essentia St. Mary's ER - Superior
3500 Tower Ave
Superior, WI 54880
(715) 817-7100

Essentia Occup. Medicine Clinic
Duluth Clinic - 3rd Street Building
400 E. Third St.
Duluth, MN
(218) 786-3392

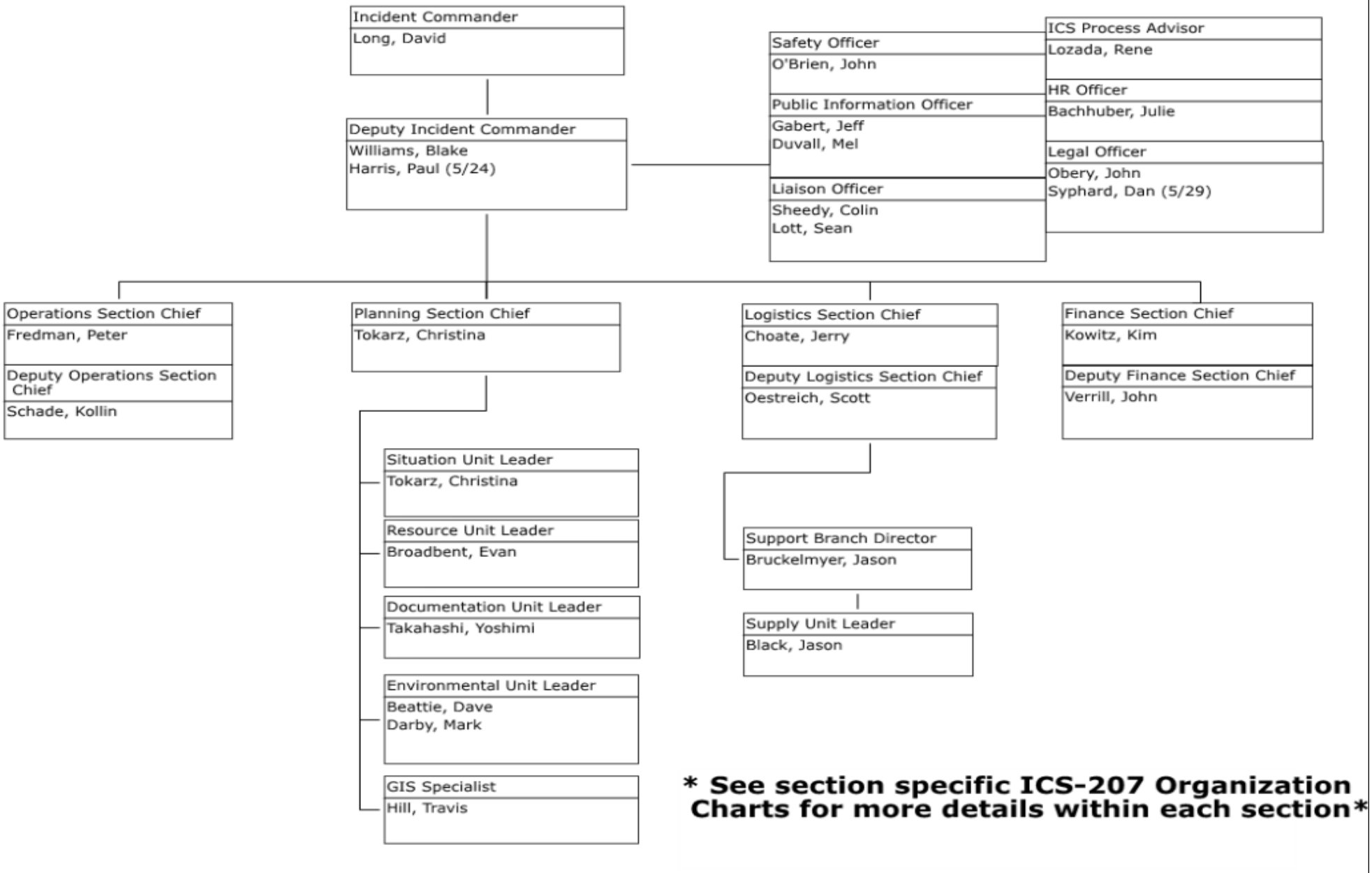
Essential St. Mary's ER - Duluth:
407 East 3rd Street
Duluth. MN
218-786-4000

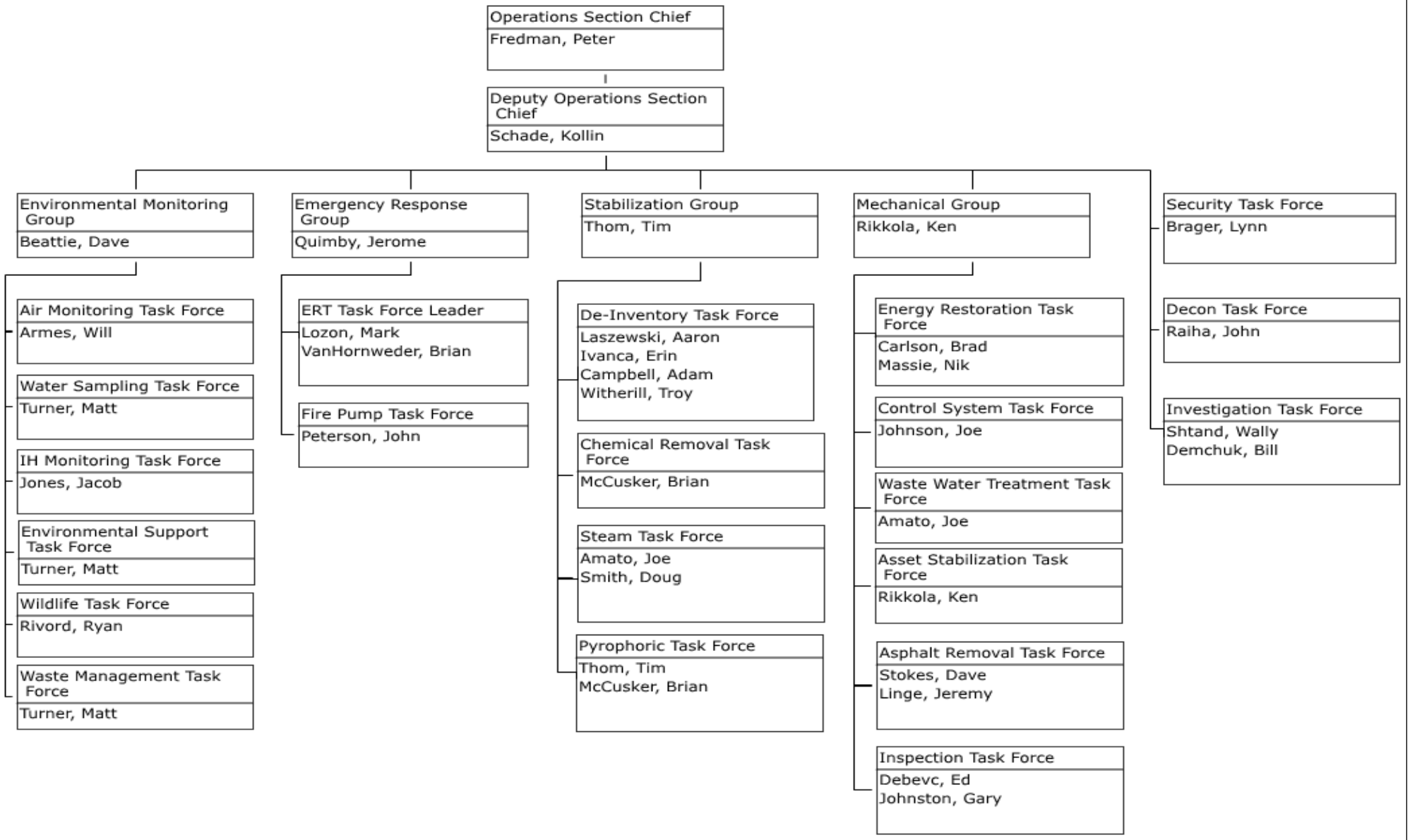
HF Serious Exposures:

Essential St. Mary's Hospital ER - Duluth:
407 East 3rd Street
Duluth. MN
218-786-4000

Serious Thermal or Chemical Burns

Essentia Miller-Dwan Burn Center
502 E. Second Street, First Floor
Duluth, MN
(218) 786-2815


Incident Commander
Long, David
Deputy Incident Commander
Williams, Blake
Harris, Paul (5/24)
Safety Officer
O'Brien, John
Public Information Officer
Gabert, Jeff
Duvall, Mel
Liaison Officer
Sheedy, Colin
Lott, Sean
ICS Process Advisor
Lozada, Rene
HR Officer
Bachhuber, Julie
Legal Officer
Obery, John
Syphard, Dan (5/29)
Operations Section Chief
Fredman, Peter
Deputy Operations Section Chief
Schade, Kollin
Planning Section Chief
Tokarz, Christina
Situation Unit Leader
Tokarz, Christina
Resource Unit Leader
Broadbent, Evan
Documentation Unit Leader
Takahashi, Yoshimi
Environmental Unit Leader
Beattie, Dave
Darby, Mark
GIS Specialist
Hill, Travis
Logistics Section Chief
Choate, Jerry
Deputy Logistics Section Chief
Oestreich, Scott
Support Branch Director
Bruckelmyer, Jason
Supply Unit Leader
Black, Jason
Finance Section Chief
Kowitz, Kim
Deputy Finance Section Chief
Verrill, John
* See section specific ICS-207 Organization Charts for more details within each section*


Operations Section Chief
Fredman, Peter
Deputy Operations Section Chief
Schade, Kollin
Environmental Monitoring Group
Beattie, Dave
Air Monitoring Task Force
Armes, Will
Water Sampling Task Force
Turner, Matt
IH Monitoring Task Force
Jones, Jacob
Environmental Support Task Force
Turner, Matt
Wildlife Task Force
Rivord, Ryan
Waste Management Task Force
Turner, Matt
Emergency Response Group
Quimby, Jerome
ERT Task Force Leader
Lozon, Mark
VanHornweder, Brian
Fire Pump Task Force
Peterson, John
Stabilization Group
Thom, Tim
De-Inventory Task Force
Laszewski, Aaron
Ivanca, Erin
Campbell, Adam
Witherill, Troy
Chemical Removal Task Force
McCusker, Brian
Steam Task Force
Amato, Joe
Smith, Doug
Pyrophoric Task Force
Thom, Tim
McCusker, Brian
Mechanical Group
Rikkola, Ken
Energy Restoration Task Force
Carlson, Brad
Massie, Nik
Control System Task Force
Johnson, Joe
Waste Water Treatment Task Force
Amato, Joe
Asset Stabilization Task Force
Rikkola, Ken
Asphalt Removal Task Force
Stokes, Dave
Linge, Jeremy
Inspection Task Force
Debevc, Ed
Johnston, Gary
Security Task Force
Brager, Lynn
Decon Task Force
Raiha, John
Investigation Task Force
Shtand, Wally
Demchuk, Bill

ICS 208 - Site Safety Plan	Version Name: Refinery Site
Incident Name: 2018 Superior Refinery Fire	Period: Period 11 [05/23/2018 06:00 - 05/30/2018 06:00]
Applies to Site: Superior Refinery	

Site Characterization

Water	**Land**	**Weather**	Partly Cloudy
Wave Height	**Land Use**	**Air Temp**	23.6 Fahrenheit
Speed		**Wind Speed**	9
Direction		**Direction**	SSW

Site Hazards

Yes	No	Hazards	Yes	No	Hazards	Yes	No	Hazards
x		Boat Safety	x		Fire, Explosion, In-situ Burning	x		Pump Hose
x		Chemical Hazards	x		Heat Stress	x		Slips, Trips, and Falls
	x	Cold Stress			Helicopter Operations	x		Steam and Hot Water
		Confined Spaces	x		Lifting		x	Trenching/Excavation
x		Drum Handling	x		Motor Vehicles		x	UV Radiation
x		Equipment Operations	x		Noise		x	Visibility
x		Electrical Operations	x		Overhead/Buried Utilities	x		Weather
x		Fatigue	x		Plants/Wildlife	x		Work Near Water

Air Monitoring Limits

Oxygen Level	19.5 to 22.5%	Benzene	1 PPM	Carbon Moxide	35 PPM
LEL	5%	Total Hydrocarbons	500 PPM	Hydroflouric Acid	3 PPM
Hydrogen Sulfide	10 PPM	Asbestos	0.1 Fiber per cc	Sulfur Dioxide	2 PPM

Engineering Controls

	Source of release secured		Valve(s) closed	x	Energy sources locked/tagged out
x	Site secured	x	Facility shut down		

Personal Protective Equipment Required

	Impervious suit	x	Hard hats	x	Boots
	Inner gloves	x	Respirators	x	Bunker Gear
x	Outer gloves	x	Eye protection	x	ERT SCBA
x	Flame resistant clothing	x	Personal flotation		

Additional Control Measures Established

x	Decontamination	x	Illumination	x	Additional stations established
x	Sanitation		Medical surveillance		Facilities provided

Work Plan

x	Booming		Excavation		Hot work
	Skimming	x	Heavy equipment	x	Appropriate permits used
x	Vac trucks	x	Sorbent pads		
x	Pumping	x	Patching		

Training

x	Verified site workers trained per local/federal regulatory requirements	**Training Requirements**	

Organization

Position	*Name*	*Telephone/Radio*	*Position*	*Name*	*Telephone/Radio*
Incident Commander	Long, David	403-542-1338	Safety Officer	O'Brien, John	218-390-4367
Deputy Incident Commander	Harris, Paul	780 522-5060	Operations Section Chief	Fredman, Peter	320-288-6161

Emergency Plan

[x]	Fire Prevention Plan	[x]	Evacuation Plan		
[x]	Alarm System	[x]	First Aid Location		

Notifications

	Facility		*Phone*		*Facility*		*Phone*
[x]	**Hospital**	Essential St. Mary's Hospital	218-786-4000	[x]	**Fire**	Superior Fire Department	911
[x]	**Ambulance**	Gold Cross	911	[x]	**Law Enforcement**	Superior Police Department	911
[ ]	**Air Ambulance**			[x]	**Emergency Response/Rescue**	Emergency Response Team	Plant Radio Channel 1

Initial Briefing

[ ]	Initial safety briefing prepared for each site

Attachments/Appendices

Attachment	***Filename***
SDSs are available on the Refinery Intranet..rtf	SDSs are available on the Refinery Intranet..rtf

SDSs are available on the Refinery Intranet.

Contact a member of the Refinery Safety Department if you have questions.

Superior Refinery Fire

Main Column Ovhd Receiver De-Inventory Plan

Authored by: Aaron Laszewski

Date: 5/18/18

Approved by:

Operations Section Chief:

Environmental Unit Leader:

Safety Officer:

Planning Section Chief:

Investigation Task Force Leader:

Incident Commander:

Prepared by Operations Section

SEE BACK

* BEGIN DE-INVENTORY IDENTIFICATION BY PIPING-LINE.

Asbestos Remediation Plan

2018 Superior Refinery Fire

Superior Refining Company LLC

Husky Superior Refinery, Superior, Wisconsin

Matthew G. Lazaric

(Wisconsin Asbestos License AII-13341)

David Keller, CIH, CSP

Operations Section Chief _____ 5/4/18

Signature **Date**

Planning Section Chief _____ 4MAY18

Signature **Date**

Incident commander _____ 5/4/18

Signature **Date**

GHD | 11719 Hinson Road Suite 100 Little Rock, Arkansas 72212

11156937

Table of Contents

1. Introduction and Objectives

At the request of Superior Refining Company LLC (SRC), a subsidiary of Husky Energy, Inc. (Husky), GHD Services Inc. (GHD) will provide air monitoring and industrial hygiene (IH) support related to the 2018 Superior Refinery fire. The incident occurred at the SRC refinery (Site) located in Superior, Wisconsin. These services are provided to assist SRC with ensuring health and safety during cleanup and management of asbestos-containing materials or suspected asbestos-containing materials (collectively, ACM) that may be encountered during the incident and subsequent response and remediation efforts.

The purpose of this work plan is to implement a systematic assessment and recovery effort. This plan addresses proper ACM management during the response and remediation phases of the project. The specific objectives include the following:

- Prevent public or site worker exposure to ACM;
- Sample and document potential airborne asbestos exposures at the site perimeter during active asbestos cleanup / abatement;
- Identify and recover ACM external to the refinery fence line;
- Identify and recover damaged ACM within plant affected by the incident;
- Periodically observe cleanup activities to ensure proper cleanup and waste packaging methods are being utilized. Observe employee and equipment decontamination procedures; and
- Where safe and appropriate, sample materials suspected to contain asbestos. At this time, bulk sample collection is anticipated to be limited to sampling insulation that is remaining on fixed plant equipment including exchangers, drums, etc., that may be damaged and may require removal or repairs as overall plant repairs are conducted.

To accomplish the objectives outlined above, we propose the following activities:

- Ambient Air Sampling plan:
    a. During asbestos abatement monitoring, air samples will be collected along the perimeter of the asbestos abatement exclusion zone.
    b. The site asbestos abatement contractor (In-Line Construction or other Wisconsin-licensed asbestos abatement contractor) will collect personal samples from their employees that are performing abatement. GHD will receive and review all personal sample results.
    c. As appropriate, collect ongoing area samples surrounding the refinery.
    d. Analysis of air samples will be performed using phase contrast microscopy (PCM) with transmission electron microscopy (TEM) to be used as needed to clarify results.

- ACM Debris Survey
    a. As access is available to interior portions of the plant, identify locations for and coordinate placing asbestos warning / danger tape around locations of potential asbestos.
    b. Perform a limited visual asbestos survey of the fire affected and other damaged areas to determine areas that have ACM debris.
    c. Mark areas that have visible ACM debris.

- Damaged ACM Survey
    a. Where safe to do so, perform an asbestos survey of the fire affected and other damaged areas to determine equipment, piping, etc. that have ACM debris.
    b. As appropriate, collect bulk samples of suspect materials to confirm asbestos content so that the materials can be properly managed during the recovery.
    c. Mark on drawings, equipment, piping, etc. that has damaged ACM debris

GHD will continue air monitoring services until the project is completed and potential worker or community exposures to airborne asbestos fibers associated with the incident are eliminated or until directed by Husky that this service should be demobilized. The air monitoring data will be collected and compiled in accordance with established IH guidelines and practices. In addition, the results will be communicated to Husky, site workers, and regulatory agencies as required and/or as necessary to ensure the safety and health of potentially affected individuals.

2. Exposure Standards and Guidelines

The US Occupational Health and Safety Administration provides established exposure limits for a worker's exposure to hazardous chemical substances. Additionally, Threshold Limit values (TLVs) are established by the American Conference of Governmental Industrial Hygienists (ACGIH).

These are summarized below:

Analyte	OSHA PEL		ACGIH TLV	Units
	TWA	Excursion (30 minute exposure)	TWA[1]	
Asbestos	0.1 f/cc	1.0 f/cc	0.1 f/cc	Fibers per cubic centimeter of air.

2.1 Perimeter Exposure Monitoring Criteria

During asbestos abatement activities, work area perimeter air monitoring will be performed to ensure that engineering controls prevent the release of asbestos fibers from the work area. If ambient air samples exceed the accepted asbestos clearance criterion of 0.01 f/cc (AHERA standard for building re-occupancy), work will be halted and controls (wetting, covering or wrapping damaged materials, etc.) will be put in place. Work will not restart until work practices and/or engineering controls are modified to ensure perimeter concentrations do not exceed the clearance criterion.

2.2 Personal Air Monitoring and Bulk Sampling Methods

During asbestos abatement activities, OSHA methods ID160 (personal air monitoring) and ID191 (bulk sampling) will be followed. The collection of air monitoring samples will be completed using calibrated personal sampling pumps with 25-mm diameter cassettes with mixed-cellulose ester (MCE) filters and analyzed by PCM. All sampling results will be communicated to abatement personnel in compliance with applicable regulations.

3. Quality Assurance/Quality Control (QA/QC) and Reporting

Data collected will be stored in an on-site electronic archive. The monitoring/sampling data will be entered into an electronic database (spreadsheet or equivalent), and will undergo a quality assurance and quality control (QA/QC) review. Data entry forms and field notes will be kept on-site and retained for reference upon completion of the project. If necessary, full laboratory analysis data packages will be provided, and associated data validation processes will be arranged.

During the project, interim reporting of results may be required. This may include data summaries, maps, or other presentations of preliminary monitoring and sampling results. For example, a data summary will be provided to SRC every 24 hours, once data have undergone an initial QA/QC. Such reporting will be considered preliminary, as a final QA/QC of the data will not be complete. At the completion of the project, a report will be prepared in which data collected through monitoring and integrated sampling analyses will be compiled, summarized, and reported to SRC. Data contained in the final report will have been through the QA/QC process, will be reviewed by a Certified Industrial Hygienist (CIH), and will be considered final.

4. Asbestos Abatement / Cleanup Plan

There are several considerations for addressing damage to ACM during the recovery and repair operations to be conducted at and surrounding the plant. In order of importance, asbestos activities will be conducted to:

1. Address insulation that is off site or outside the refinery boundaries as a result of the incident. In instances observed to date, the insulation outside the refinery boundary or off refinery property is not suspect ACM. However, as a conservative response, insulation from the incident that is identified outside the refinery property will be collected for proper disposal.
2. Small-scale, short duration asbestos abatement activities needed to accommodate mechanical or process activities required to stabilize and de-energize refinery equipment and piping.
3. Large-scale cleanup of asbestos-containing debris, removal of asbestos-insulated equipment that is scheduled for demolition, removal and disposal of asphalt that may be contaminated with asbestos due to damage to mechanical equipment insulation.

4.1 Offsite / Extra-refinery Cleanup

Off-site cleanup of potential ACM debris from the refinery will be accomplished using the site embedded asbestos abatement contractor or other Wisconsin-licensed asbestos abatement contractor. The contractor will perform the cleanup of ACM primarily using manual methods.

As a conservative measure, materials identified offsite will be assumed to be ACM, and packaged and disposed of as such. Representative samples of collected materials will be taken for laboratory analysis to determine asbestos content. A general map will be generated to identify locations where debris has been located offsite.

Work methods and personal protective equipment (PPE) will be selected and utilized in accordance with existing regulations and based on the asbestos abatement contractor personnel exposure monitoring program records.

Should any pieces of metal that may be considered "evidence" be encountered during offsite insulation cleanup, the location will be recorded via GPS coordinates and Baker Engineering and Risk Consultants (BakerRisk) will be contacted to facilitate removal of evidence pursuant to the General Protocol for Identification and Collection of Evidence Items.

4.2 Small-Scale, Short Term Abatement

As may be required, and similar to routine maintenance, the operations and mechanical organizations will require limited scope asbestos abatement of mechanical equipment to accommodate the process of draining, de-energizing, and stabilizing the plant equipment. To accomplish this, the mechanical and process planners will coordinate directly with the abatement contractor to scope and schedule the smaller projects. This coordination will include measures (such as exclusion zones, barrier tape, and/or signage) to minimize the risk of exposure to non-abatement personnel.

The abatement contractor will make available adequate personnel to accommodate the limited abatement.

Abatement methods and techniques will vary and may include glovebag removal, mini enclosures, wrap and cut (whole pipe removal) or other methods as appropriate and as allowed by applicable regulations; provided, however that GHD will inform and receive consent from BakerRisk before removal of piping, process equipment, or structural components. All collected insulation materials will be packaged and disposed as ACM.

Should any pieces of metal that may be considered "evidence" be encountered during offsite insulation cleanup, the location will be recorded via GPS coordinates and Baker Engineering and Risk Consultants (BakerRisk) will be contacted to facilitate removal of evidence pursuant to the General Protocol for Identification and Collection of Evidence Items.

Decontamination procedures following abatement may vary from standard abatement decontamination. Decontamination facilities typical for asbestos abatement (multiple stage structures with showers) will be available and will be utilized. It may be necessary to perform additional decontamination steps to address the presence of asphalt throughout the work areas. The need for additional decontamination steps will be determined prior to the start of any individual project and any decontamination procedure outside the routine change and shower asbestos procedure will be performed with the assistance of SRC personnel and facilities.

4.3 General Asbestos Abatement and Site Cleanup

Once the site has been stabilized and equipment has been drained and de-energized, general site abatement and cleanup will commence. To the extent practicable, ACM that can be removed will be removed prior to conducting demolition activities that may disturb ACM. If limited demolition activities are required to gain access for ACM to be removed, work will be done in such a manner to minimize the risk of exposure. The work will include measures (such as exclusion zones, barrier tape, and/or signage) to minimize the risk of exposure to non-abatement personnel.

The cleanup methods to be utilized will, to some extent, be determined by successful methods that were developed during the work performed in previous remedial work phases. Those methods may include glovebag, enclosure removal, and alternative methods approved by the Wisconsin Department of Natural Resources. Large-scale removal of asphalt will require the use of heavy equipment. All collected insulation materials will be packaged and disposed as asbestos-containing materials.

Personal decontamination procedures following abatement may vary from standard abatement decontamination, but will generally following decontamination procedures accordance with 29 CFR 1910.120 (k). Decontamination facilities typical of asbestos abatement (multiple stage structures with showers) will be available and will be utilized. It may be necessary to perform additional decontamination steps to address the presence of asphalt throughout the work areas. The need for additional decontamination steps will be determined prior to the start of any individual project and any decontamination procedure outside the routine change and shower asbestos procedure will be performed with the assistance of Husky personnel and facilities.

Decontamination measures will be implemented to prevent contaminant tracking on and off Site. Vehicles, equipment, and workers leaving areas of potential contamination will exit through a Decontamination Reduction Zone (DRZ) prior to entry into Clean Zones from the Exclusions Zones. The DRZ will contain an equipment decontamination pad to accommodate the largest piece of on Site potentially contaminated equipment. The decontamination pad will be formed with a bed and berm, overlain by one layer of high-density polyethylene sloping toward a sump. The DRZ will provide, operate, and maintain portable, high pressure, wash units. The DRZ will maintain necessary equipment, pumps, and piping required to collect and contain equipment decontamination wastewater and sediment and transfer same to approved storage facilities. Decontamination facilities and work activities will be sequenced to prevent contaminant tracking

Copy

An MOC was held to discuss the deinventorying of the Main Column Overhead Receiver

The water boot drain line will be used to drain the Main Column Overhead Receiver. A vac truck will be connected to the drain line to remove the liquid that cannot be gravity drained from the vessel. Once the hydrocarbon is drained from the vessel the vac truck will be disconnected and a firewater hose will be connected to the drain line. Firewater will be used to flush the receiver. An operator will be monitoring the water entering the vessel by monitoring the sight glasses on the water boot and on the receiver. The vac truck will be reattached so the water can be drained from the receive. A nitrogen sweep will be maintained on the system to ensure the draining of the receiver will not cause air to enter the system while draining.

A nitrogen purge will remain on the system after the draining procedure is completed.

A plan will be developed to send the hydrocarbon waste to either a frac tank or directly to a slop tank.

Process Engineering has been working with Operations to identify the proper valves to use for this process. P&IDs will be provided to operators for verification.

Per de-inventorying procedure, a fire plan will be put in place before the wash starts, and fire blankets will be provided as necessary for operations to work around the residual asphalt on the ground. All other standard occupational safety procedures identified will be followed as relevant, including asbestos abatement plans, vac truck bonding and grounding, pre-fire plan and environmental waste disposal.

The operators will follow the written procedure for this process, and any deviations to the procedure will be discussed by at least 3 competent personnel and will be tracked using the "proposed procedure change form" that is attached to the excessing procedure.

A contingency plan that includes a "All Stop" will be developed in the event of a material release.

Copy

SUPERIOR REFINERY MANAGEMENT OF CHANGE (MOC)

Section 1 **DESCRIPTION OF PROPOSED CHANGE** **MOC No:** **2493**

Title of Change: Deinventorying the Main Column Overhead Receiver

Change Coordinator: Aaron Laszewski Date: 5-18-2018

Unit: FCCU

Type of Change

Equipment Change	Procedure /Operations Change
☐ What-If Checklist (PHA) or Hazop Note: PHA required for design changes. Note: What-If Checklist is attached to the end of this document when needed.	☒ PROCEDURE / OPERATIONS
☒ PSR (Pre-Start up always Reg.)	☐ S/D CONTROLS / SIS / LIMITS / S/D Interlocks
	☐ OTHER

Duration: ☐Permanent ☐ Permanent Shutdown ☒Temporary (6 Months) ☐Temporary Shutdown (Requires S/D to complete)

Description: (attach detailed information) Deinventorying the Main Column Overhead Receiver

Technical Basis for Change: (design considerations) Cannot make the receiver hydrocarbon free through normal means – Deviation from normal procedure.

Approval in the off-hours and Emergency – When changes are required in the off-shift hours or in an emergency the Refinery Shift Superintendent has the authority to authorize the change.

Section 2 **MOC Team**

MOC TEAM (Individuals impacted by change that may need to be involved in the PHA or Pre-Startup Review)

X if YES	DEPARTMENT	Name	X if YES	DEPARTMENT	Name
☐	Rotating Equipment		☐	Shift Supervisor	
☐	Electrical		☐	Inspection	
☐	Maint Engr		☒	Safety	Tim Murphy Eddie Ramirez
☐	Project Engr		☐	Environmental	
☒	Process Engr	Aaron Laszewski Zak Fredericks	☒	PSM/RMP	Becki Meyers
☐	Maint Supervisor		☐	Area Superintendent	
☐	Instrumentation		☒	Operations Manager	Brian McCusker
☐	Advanced Controls		☐	Contractor	
☒	Operation Rep	Keith Nordskog	☐		

ISSUES FOR DISCUSSION
EXPANDED TO MORE SPECIFIC QUESTIONS

A. Process Safety Information

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Alarm Rationalization & Priorities Established and Set In DCS		
☐	☐	Cause & Effect Diagrams		
☐	☐	DCS Graphics Update		
☐	☐	Elec. Area Class Drawing		
☐	☐	Electrical One Lines		
☐	☐	Equipment Limits & Design Codes		
☐	☐	Superior EP's Followed-Deviations		
☐	☐	Line Sloped (i.e. flare headers)		
☐	☐	Material & Energy Balance		
☐	☐	P&IDs		
☒	☐	P&ID's Available to Operations (Red lines OK)	Aaron Laszewski	
☐	☐	PFD		
☐	☐	Plot Plan		
☐	☐	Maximum Inventory Update		
☐	☐	PI Data		
☐	☐	Process Chemistry		
☐	☐	PSV Database Design Basis		
☐	☐	Safe Operating Limits		
☐	☐	Verify Flare Capacity Study is Current		
☐	☐	Equipment/line#/Index Database Update		
☐	☐			

B. Process Hazards Analysis

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Action	Assigned To / Completed By	Date Completed
☐	☐	Car Seal List		
☐	☐	Design Changes Were Re-Hazoped		
☐	☐	LOPAs Completed		
☐	☐	PHA Completed as Required		
☐	☐	PHA Recommendations Complete		
☐	☐	RMP Update		
☐	☐			

C. Health Issues

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☒	☐	Asbestos/Lead Paint Program	GHD	
☐	☐	Employee Exposure & Personal Monitoring/Records		
☐	☐	HAZCOM Equipment Labels		

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☒	☐	Proper PPE Identified	Tim Murphy	
☐	☐	SDS list		
☒	☐	Stenciling/Labeling – Nitrogen line to MC/Flare	Keith Nordskog	
☐	☐	Building/Trailer Siting		
☒	☐	Fire Blanketing provided as necessary	GHD	

D. Environmental Issues

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	CEMS installed and calibrated correctly		
☐	☐	LDAR Field Tags & Data Base Updated		
☐	☐	Marked Up P&ID received by LDAR Before S/U		
☐	☐	Notify LDAR group when system is starting		
☐	☐	Provide Marked up P&ID to LDAR Before S/U		
☐	☐	RATA/Ops. Env.		
☐	☐	Sewer PTI - Verify if Leak Test is Required		
☐	☐	Shutdown/Startup Checklist (SSM)		
☐	☐	Title V Update/PTI and/or Update		
☒	☐	Waste Disposal – Frac tank or slop tank	Aaron Laszewski	
☐	☐	BWON Waste Stream Additions		
☐	☐	QQQ Drain Impacts		
☐	☐	Environmental Permit Triggers		
☒	☐	Air Monitoring	GHD	

E. Mechanical Integrity

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
PIPING & STATIONARY EQUIPMENT –				
☐	☐	Inspection Drawings		
☐	☐	Flange Management - Bolts Torqued per Requirements		
☐	☐	Chain Wheel Operators		
☐	☐	Clamp List		
☐	☐	CUI Removed or Protected		
☐	☐	Dead Legs		
☐	☐	Field Inspection (QA/QC) Reports		
☐	☐	Gaskets & Packings Checked		
☒	☐	Grounding Wires – Vac Truck	Eric Barnard	
☐	☐	Inspection PSV/TRV Database		
☐	☐	Inspection Recommendations		
☐	☐	Insulation Installed		
☐	☐	Maint. Tightness Check		
☐	☐	Operations Tightness Check		
☐	☐	PMI (Positive Material Identification) Completed		
☐	☐	Protective Coatings		
☐	☐	Valve Bench PSV Test Reports		
☐	☐	Vendor Drawings		
☐	☐	Vessel/Pipe Shop Insp. package		

SUPERIOR REFINERY MANAGEMENT OF CHANGE (MOC)

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐			
☐	☐			
CONTROLS				
☐	☐	Alarm Database Update		
☐	☐	Alarm Response Update		
☐	☐	Calibration & Testing Data		
☐	☐	Control System FAT/SAT Reports		
☐	☐	Critical/Testing Reports Complete		
☐	☐	EIV Field Tests		
☐	☐	EIV PM Database Update		
☐	☐	Loop Folders & Test Reports		
☐	☐	SIS Database and Field Testing		
☒	☐	Pressure gauges to monitor MC and Flare purge	Keith Nordskog	
ELECTRICAL				
☐	☐	Cathodic Protection		
☐	☐	Electric Heat Trace Test Reports		
☐	☐	Equipment Files		
☐	☐	Field Test Reports		
☐	☐	Protective Relay Settings		
☐	☐	Max AMP Level Established		
☐	☐	Mfgr. Test Reports Received		
☐	☐	Field Equipment Labeling		
☐	☐	Motor Database Update		
☐	☐			
ROTATING EQUIPMENT				
☐	☐	Equipment Files		
☐	☐	Field Final Alignment & settings		
☐	☐	Lubricants & Fluids at Level		
☐	☐	Vibration Probes Functional		
☐	☐			
MECHANICAL INTEGRITY GENERAL				
☐	☐	Change in PM Schedule Identified		
☐	☐	Enter a SAP WO for Shutdown Worklist		
☐	☐	Spare Parts On-Hand		
☐	☐	Vessel Media Inspected		
☒	☐	Add temporary lines, check valve in nitrogen line – work order	Aaron Laszewski	
☐	☐			

F. Operating & Maintenance Procedures

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
OPERATING PROCEDURES				
☐	☐	Emergency Operations		
☐	☐	Emergency Shutdown		
☐	☐	Initial Startup		
☐	☐	Normal Operations		

SUPERIOR REFINERY MANAGEMENT OF CHANGE (MOC)

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Normal Shutdown		
☒	☐	Temporary Operations	Aaron Laszewski	
☐	☐	Turnaround Startup		
☐	☐	Will change effect S/D, S/U or bypass operations		
OPERATING LIMITS				
☐	☐	Operations Alarm Response		
☐	☐			
MAINTENANCE PROCEDURES/PROGRAMS				
☐	☐	Procedures Updated or Developed		
☐	☐			
GENERAL				
☐	☐	Blind List Updates/Change		
☒	☐	Isolation/LOTO Plan	Keith Nordskog	
☐	☐	Unit Checklist/Log Sheets (Outside & Control) Updated		
☒	☐	Procedure deviation tracking	Aaron Laszewski	

G. Training

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Contractor Training		
☐	☐	Training Database Updated		
☐	☐	Maintenance Training		
☒	☐	Notification	Pete Raboin	
☐	☐	Operations Training		
☐	☐	Training Manual/Drawings Updated		
☐	☐			

H. Pre-Startup Safety Review

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Equipment Service Contracts		
☐	☐	Extra Startup Manpower		
☐	☐	Inspection and Testing Complete		
☐	☐	Pre-Startup Walk-Through & Punchlist		
☐	☐	Field Post-Startup Punch List (for applicable projects)		
☐	☐			

SUPERIOR REFINERY MANAGEMENT OF CHANGE (MOC)

I. Work Authorization

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Blind Lists for Work		
☐	☐	Confined Space Entry		
☐	☐	Hot Tapping		
☐	☐	Hot Work		
☒	☐	Job Hazard Analysis (JSA/JSR)	Aaron Laszewski	
☐	☐	LOTO		
☐	☐			

J. Contractors

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☒	☐	Contractor Communication/Notifications	Aaron Laszewski	
☐	☐			

K. Safety & Emergency Planning and Response

Also review all outstanding items from previous PSRs and PHA.

Pre S/U	Post S/U	Update Existing / Create New	Assigned To / Completed By	Date Completed
☐	☐	Emergency Response Drills/Training		
☐	☐	Emergency Response Plan (ERP)		
☐	☐	Fire Response Equipment & Inspection Records		
☒	☐	Pre-Fire Plans	Jerome Quimby	
☐	☐	Safety Equipment (SCBA, Showers, PPE)		
☐	☐	Update changes to SPIs or Procedures		
☐	☐			

Section 3 APPROVAL TO INSTALL

Area Supervisor or Other Approving Authority

Date

Section 4 APPROVAL TO STARTUP (Follows PSR 5 Pre-Startup Safety Review) Prior to filling out this, all Pre-Startup Action Items should be completed. Review PSR 5 and other previous PSRs.

Operations Manager or Other Approving Authority

Date

Section 5 FINAL DOCUMENTATION COMPLETE

This section should not be filled in until all agreed-upon post startup activities should be completed. Review Pre-startup documents and MOC open items from previous PSRs and PHA.

Change / Project Coordinator

Date

(Maintenance, Project or Process engineers, etc.)

CTEH CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Flammability & Explosion Hazard Assessment
CHARM Modeling Simulations – FCC/Gas Con Main Column Overhead Receiver

To: Zac Fredericks (Barr/Husky)

Cc: Chip Day, SRS

From: Scott Skelton, MS, CIH

Date: May 17, 2018

Re: Summary report for dispersion modeling simulations analyzing flammability risk

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1 Introduction

Chemical inventory assessment conducted post-fire suggest that flammable gas and flammable liquids remain in piping, vessels, and other process equipment in varying quantities. During the de-inventory process, flammable liquids and gas will be removed from affected refinery installations using closed-loop machinery and equipment with vapor controlled by a portable flare capable of generating ignition in a flammable atmosphere. In support of safe-work practices during de-inventory, Specialized Response Solutions (SRS) has conducted air dispersion modeling to simulate release of flammable liquids and gases to assess the potential for flammable atmospheres near potential ignition sources. Air dispersion simulations were run using the Complex Hazardous Air Release Model (CHARM™), which is a computer-based software that uses Eularian Grid puff-to-plume algorithms to depict downwind chemical mass transport.

2 Chemical Selection

Natural gasoline has been identified as the primary liquid stream currently in the process units along with a small vessel containing propane at a pressure of 100 psi. The chemicals selected for simulations include: naphtha and gasoline as surrogates reflecting the chemical property range of natural gasoline, and propane as the flammable gas contained in the Merox vessel stored at 100 psi.

3 Simulation Scenarios

The following scenarios describe the basis for the release characteristics, which are intended to represent a worst-case scenario during de-inventory activities.

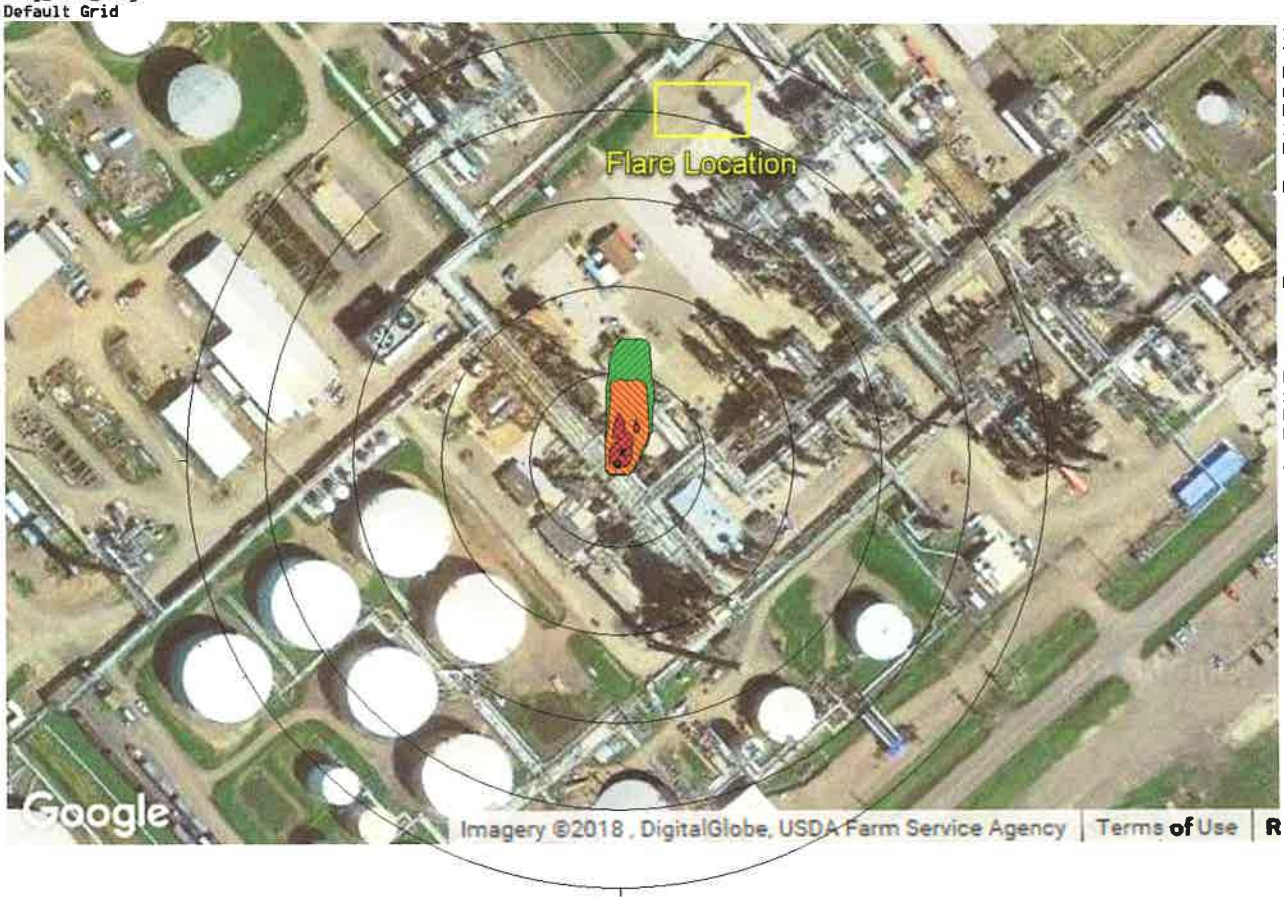
1. **Propane**
    a. Site personnel identified a stored volume of propane gas in the Merox vessel measuring 48" in diameter and approximately 13' 11.5" in height. The total pressure on the vessel was observed at 100 psi.
    b. The release scenario depicts a catastrophic failure of containment resulting in de-pressurization of the vessel to atmospheric pressure (14.7 psi), indicating that all contained propane is released into the work area.
2. **Naphtha**
    a. The process equipment contained a gasoline range liquid prior to the facility fire. Although it can be loosely identified as a natural gasoline, there remains no information on the exact speciation of the hydrocarbon mixture. The lower end of natural gasoline's flammable range is best represented in chemical properties by petroleum distillates otherwise known as naphtha.
    b. The naphtha simulation involves an instantaneous release of 1000 US gallons onto the ground resulting in a pool of flammable liquid approximately 63 feet in diameter and 0.5 inches deep.
3. **Gasoline**
    a. The process equipment contained a gasoline range liquid prior to the facility fire. Although it can be loosely identified as a natural gasoline, there remains no information on the exact speciation of the hydrocarbon mixture. The upper bound of natural gasoline's flammable range is best represented in chemical properties by gasoline, which also exhibits a slightly higher lower flammable range and flash point when compared to naphtha.
    b. The gasoline simulation involves an instantaneous release of 1000 US gallons onto the ground resulting in a pool of flammable liquid approximately 63 feet in diameter and 0.5 inches deep.
4. **Gasoline Pool Fire**
    a. The stabilization and manipulation of compromised process lines; sumps or vessels may lead to the unintended release of flammable hydrocarbon liquid and vapor. The potential for ignition exists during mechanical manipulation of process equipment. The gasoline pool fire simulation is intended to represent the thermal energy emitted during combustion of the flammable vapor directly above the pooled gasoline.
    b. Simulations were run for 1,000 gallons of gasoline to depict a reasonable range of worst-case release based upon estimates of liquids in the FCC Gas Con unit.

4 Results

4.1 Propane

The highest concentration predicted for airborne propane extends 8 feet from the Merox vessel at a height of 8 feet above grade. The maximum concentration predicted resulted in approximately 52,000 ppm (5.2%), which exceeds the lower flammability limit of 21,000 ppm (2.1%). However, at the flare location the maximum concentration predicted for propane resulted in approximately 182 ppm (well below the lower flammability limit of propane) at a time period of 90 seconds post-release. This significant reduction in airborne concentration from the source is due to the effect of air entrainment-induced dilution of the migrating plume.

Merox Vessel Propane - Flare Protection
Species: Propane
Met:Sunny_warm_very unstable
Grid:Default Grid



Integrated Plume
Time: 02:00
Height: 0 ft
Above Ground
Radius: 488 ft
Increment: 100 ft
Plot Scale 1:2495

Hatch Conc(ppm)	Max Dist
1e+003	143 ft
2.1e+003	96 ft
2.1e+004	55 ft

Hatch Conc(µg/m³)
1.79e+006
3.76e+006
3.76e+007

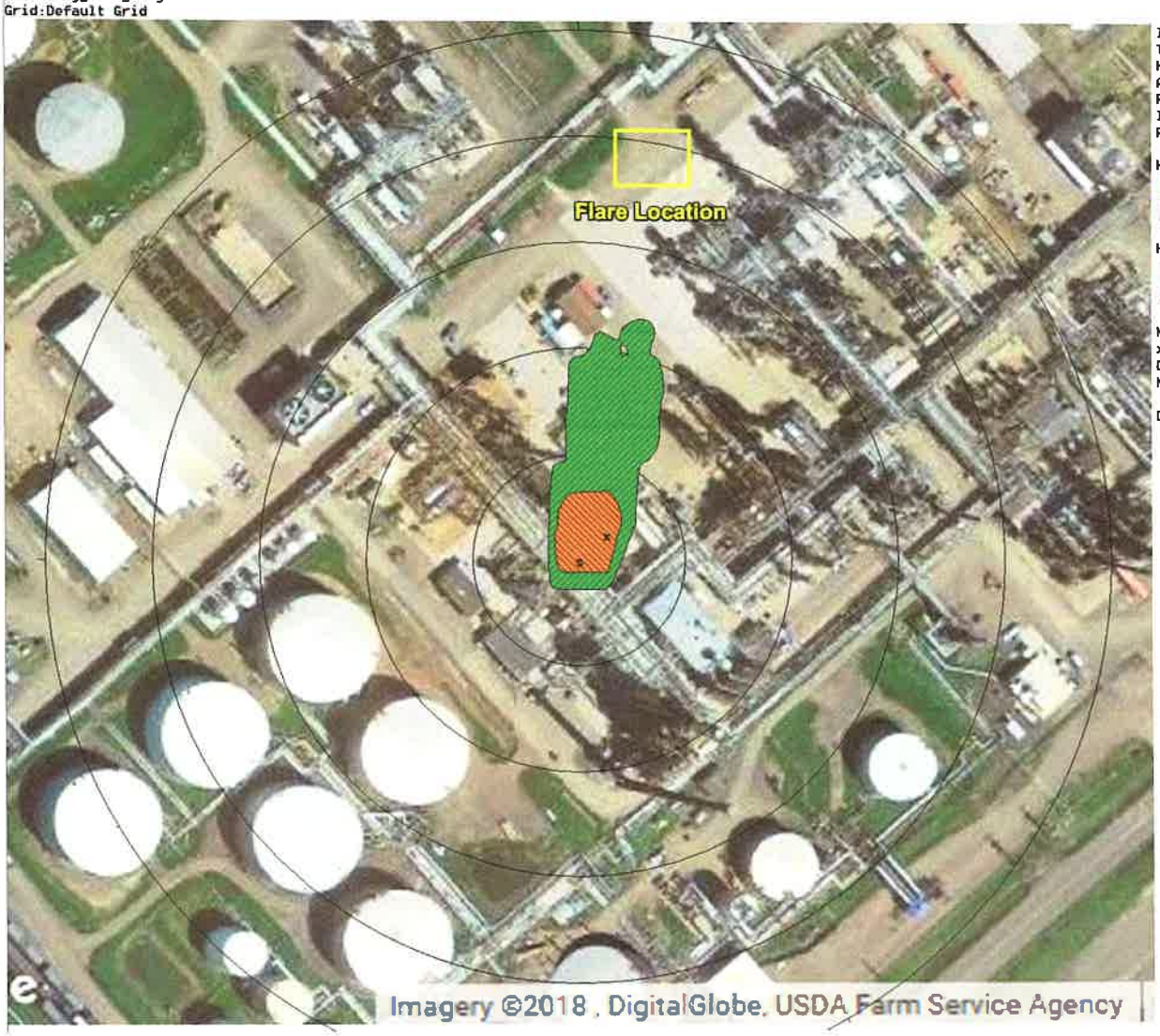
Max Conc
x = 4.512e+004 ppm
Dist: 15 ft Ang: 22
Max Conc at hgt 8 ft
5.265e+004 ppm
Dist: 28 ft Ang: 34

4.2 Gasoline

The release scenario of 1000 gallons of gasoline assumes a liquid pool formation of approximately 63 feet in diameter and 0.5 inches in depth. The model also assumes the pool evaporation duration of 59 minutes at an average evaporation rate of 5,500 lbs./hour.

The highest concentration predicted for airborne gasoline vapor extends 35 feet from the FCC Gas Con Unit at a height of 3 feet above grade. The maximum concentration predicted resulted in approximately 4,088 ppm (0.4%), which is above the site action level of 1,400 ppm (10% of LEL), but below the lower flammability limit of 14,000 ppm (1.4%). However, at the flare location the maximum concentration resulted in approximately 115 ppm (well below the lower flammability limit of propane) at a time period of 3 minutes post-release. This significant reduction in airborne concentration from the source is due to the effect of air entrainment-induced dilution of the migrating plume.

Hydrocarbon Releaes - Flare Protection
Species: Gasoline
Met:Sunny_warm_very unstable
Grid:Default Grid



Integrated Plume
Time: 00:10
Height: 0 ft
Above Ground
Radius: 500 ft
Increment: 100 ft
Plot Scale 1:2555

Hatch	Conc(ppm)	Max Dist
	200	236 ft
	1.4e+003	72 ft
	1.4e+004	0 ft

Hatch	Conc(µg/m³)
	7.01e+005
	4.9e+006
	4.9e+007

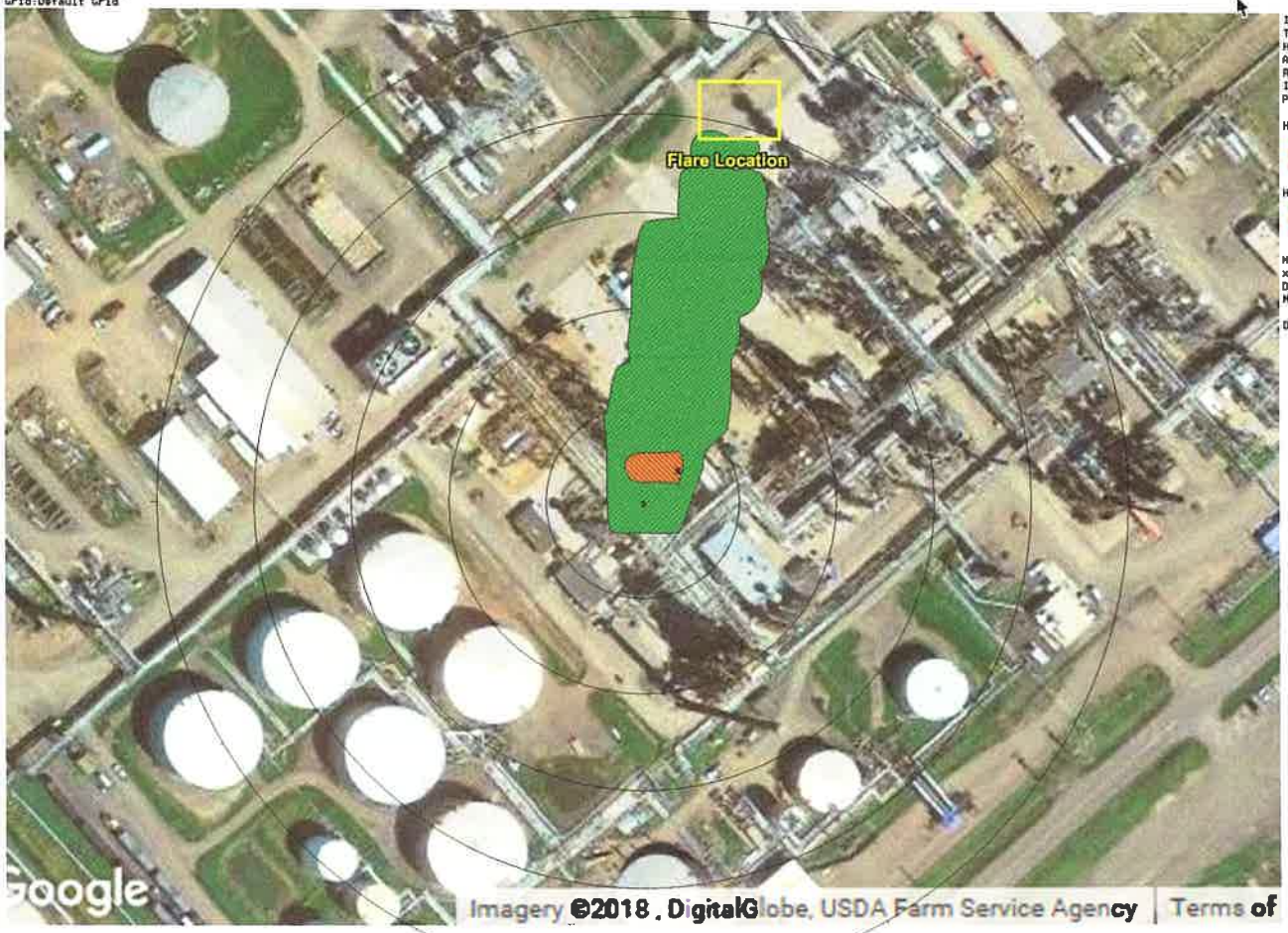
Max Conc
x = 4088 ppm
Dist: 35 ft Ang: 47
Max Conc at hgt 3 ft
4088 ppm
Dist: 35 ft Ang: 47

4.3 Naphtha

The release scenario of 1000 gallons of naphtha assumes a liquid pool formation of approximately 63 feet in diameter and 0.5 inches in depth. The model also assumes the pool evaporation duration of 66 minutes at an average evaporation rate of 5,820 lbs./hour.

The highest concentration predicted for airborne naphtha vapor extends 47 feet from the FCC Gas Con Unit at a height of 3 feet above grade. The maximum concentration predicted is approximately 1,033 ppm, which is above the site action level of 800 ppm (10%LEL), but falls below the lower flammability limit of 8,000 ppm (0.8%). However, at the flare location the maximum concentration predicted for hydrocarbon vapor resulted in approximately 90 ppm (below the lower flammability limit of naphtha) at a time period of 2 minutes seconds post-release. This significant reduction in airborne concentration from the source is due to the effect of air entrainment-induced dilution of the migrating plume.

Hydrocarbon Releases - Flare Protection
Species: Naphtha
Met:Sunny_warm_very unstable
Grid:Default Grid



Integrated Plume
Time: 00:10
Height: 0 ft
Above Ground
Radius: 500 ft
Increment: 100 ft
Plot Scale 1:2555

Hatch Conc(ppm)	Max Dist
100	393 ft
800	63 ft
8e+003	0 ft

Hatch Conc(ug/m³)
4.1e+005
3.28e+006
3.28e+007

Max Conc
x = 1834 ppm
Dist: 49 ft Ang: 47
Max Conc at hgt 3 ft
1834 ppm
Dist: 49 ft Ang: 47

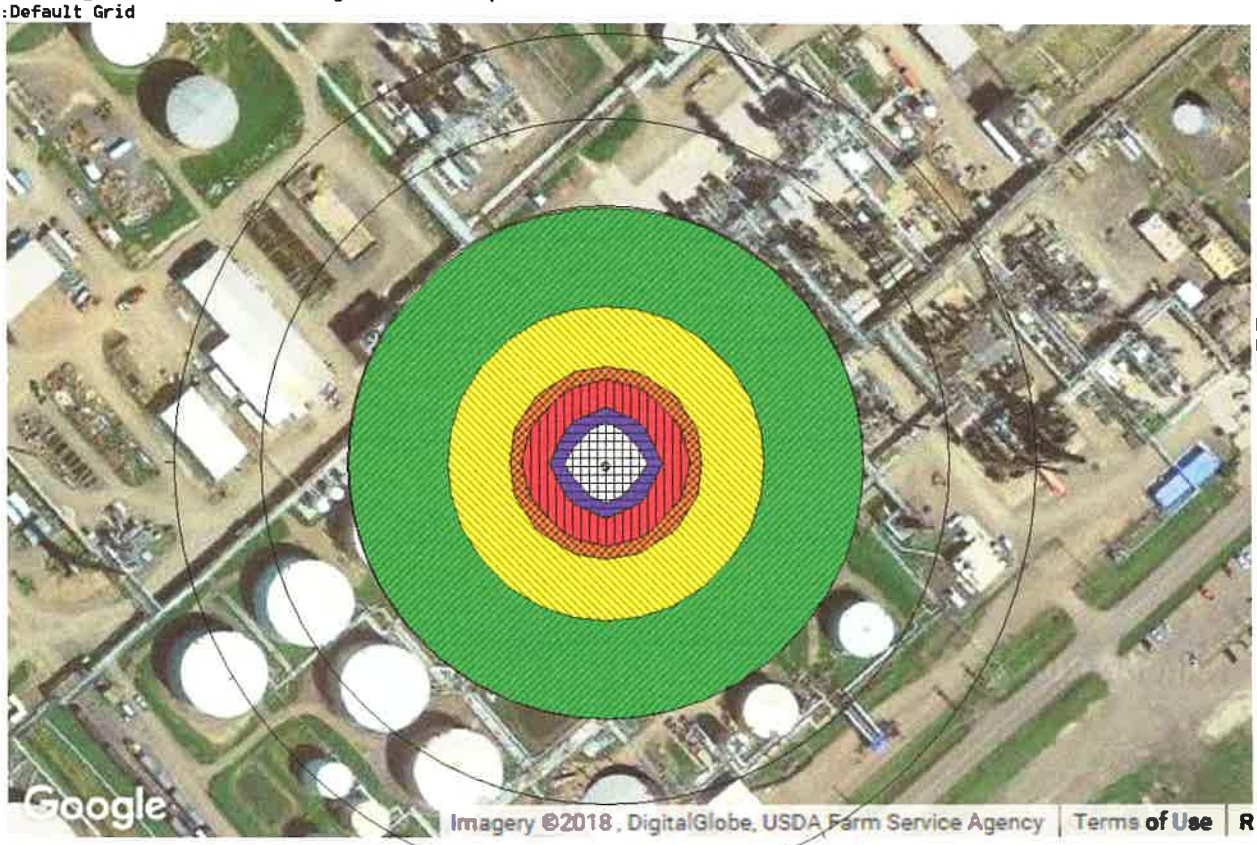
4.4 Gasoline Pool Fire

4.4.1 Gasoline Pool Fire – 1,000 gallon release

The model predicts a pool fire with a diameter of 43 feet of the 63 feet spill area at a consumption rate of 133,000 lbs/hr. The maximum temperature predicted is 3611 ^{0}F with an output of 588 million BTU/hr thermal output rate (172,000 kW) at a flame tilt of 40^0 based on the 0.5 mph wind used in the simulation. The model estimates the flame center to be 70 feet with a flame length of 139 feet and a burn time of 1.35 minutes. The model predicts a fatality rate of 1.0 (100%) to extend 48 feet from the flame center, a fatality rate of 0.99 (99%) extending 65 feet from the flame center, a fatality rate of 0.49 (49%) extending 98 feet from flame center, and a fatality rate of 0.17 (17%) extending 113 feet from the flame center. The probability of fatality is based on heat energy likely to cause fatality to an unprotected human body. The following are damaged estimates based on radiation intensity in kW/m^2. Source: *Guidelines for Chemical Process Quantitative Risk Analysis,* American Institute of Chemical Engineers Center for Chemical Process Safety, NY, NY, 1989. The resultant simulation distances are included as sub-set line items based on the damage estimate values.

- 1.6 - Will cause no discomfort for long exposure
    - Predicted radius: 299 feet, max height: 330 feet
- 4.0 - Sufficient to cause pain to personnel if unable to reach cover within 20 seconds; however, blistering of the skin (second degree burns) is likely; 0% lethality.
    - Predicted radius: 184 feet, max height: 224 feet
- 9.5 - Pain threshold reached after 8 seconds; second degree burns after 20 seconds.
    - Predicted radius: 113 feet, max height: 167 feet
- 12.5 - Minimum energy required for piloted ignition of wood; melting plastic tubing.
    - Predicted radius: 98 feet, max height: 167 feet
- 25.0 - Minimum energy required to ignite wood at indefinitely long exposures (non-piloted).
    - Predicted radius: 65 feet, max height: 166 feet
- 37.5 - Sufficient to cause damage to process equipment.
    - Predicted radius: 48 feet, max height: 164 feet

Main Column Overhead Receiver_1000gal
Species: Gasoline
Met:Gasoline_ cool weather -extremely unstable-0.5mphwind
Grid:Default Grid



Pool Fire Radiation
Time: 00:01
Height: 0 ft
Above Ground
Radius: 500 ft
Increment: 100 ft
Plot Scale 1:2555

Duration: 1.35 min
Flame center: 70 ft
Flame length: 139 ft
Tilt: 0°
RMP Dist: 153 ft

Flux Units: kW/m²

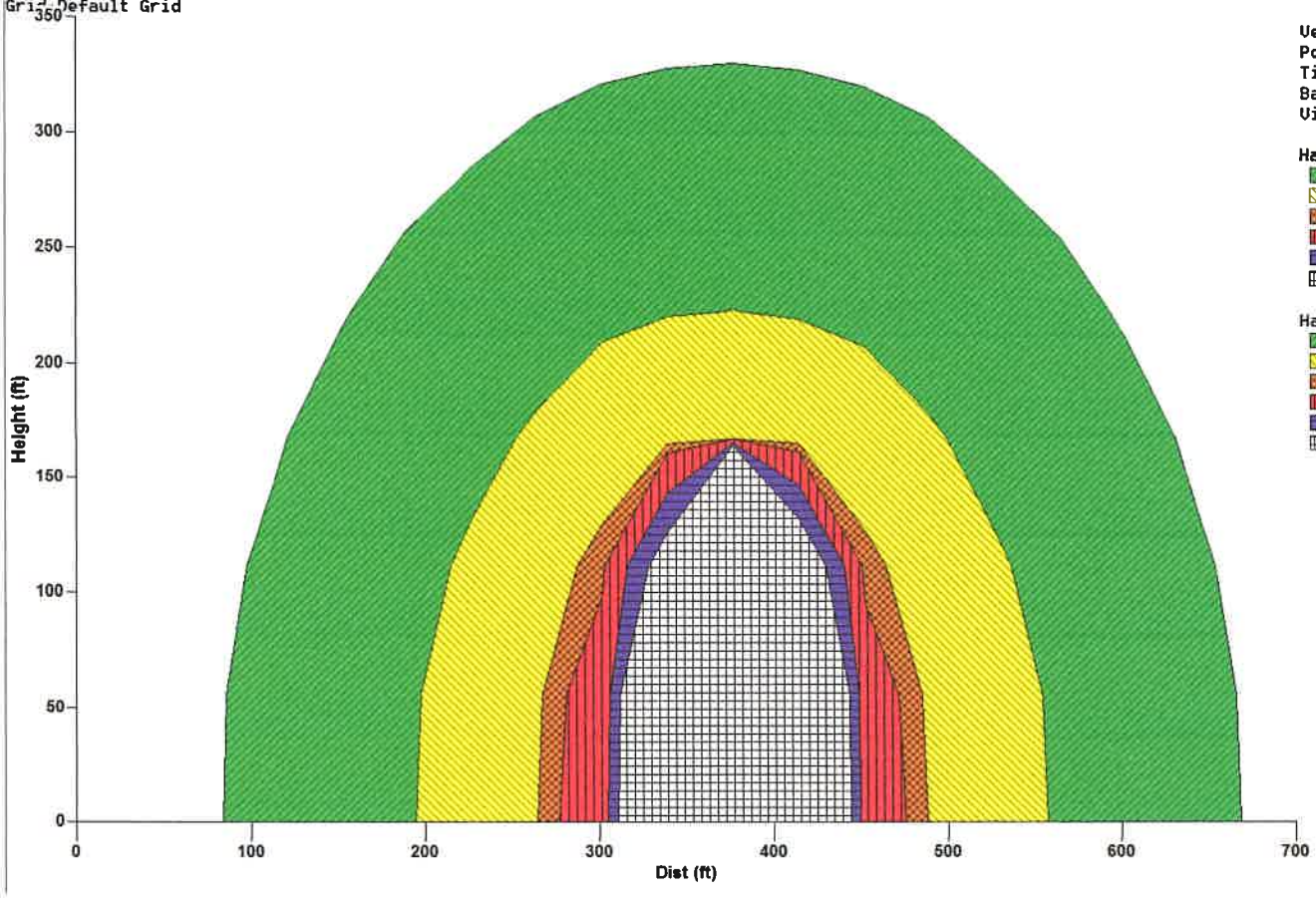
Hatch	Flux	Radius
	1.6	299 ft
	4	184 ft
	9.5	113 ft
	12.5	98 ft
	25	65 ft
	37.5	48 ft

Hatch	Flux	P(fatal)
	1.6	0.00
	4	0.00
	9.5	0.17
	12.5	0.49
	25	0.99
	37.5	1.00

Dose: (kW/m²)^(4/3)-sec

Hatch	Flux	Dose
	1.6	152.06
	4	515.96
	9.5	1634.93
	12.5	2357.30
	25	5940.03
	37.5	10199.45

Main Column Overhead Receiver_1000gal
Species: Gasoline
Met:Gasoline_ cool weather -extremely unstable-0.5mphwind
Grid: Default Grid



Vertical X-Section
Pool Fire Radiation
Time: 00:01
Base Hgt: 0 ft
View angle: 126

Hatch	BTU/hr ft²	Max Hgt
	508	330 ft
	1.27e+003	224 ft
	3.01e+003	167 ft
	3.97e+003	167 ft
	7.93e+003	166 ft
	1.19e+004	164 ft

Hatch	kW/m²	Min Hgt
	1.6	0 ft
	4	0 ft
	9.5	0 ft
	12.5	0 ft
	25	0 ft
	37.5	0 ft


05 18 2018

05 18 2018

	SUPERIOR REFINERY	OPERATING PROCEDURE
	Title: De-Inventory of Main Column Receiver	
	Sub-title:	

Date written: 5/17/18
Written by: Aaron Laszewski
Approval date:
Approved by:
Revision no:

Procedure no: OPP0000
File no: o:\procedure example
Last revised date:
Revised by:

PURPOSE/SCOPE OF PROCEDURE

Draining the Main Column Overhead Receiver to a vacuum truck.

SAFETY AND HEALTH CONSIDERATIONS

Reference the Safety Data Sheet (SDS) for all chemicals/catalyst/products in the process to obtain the properties of and hazards presented by these chemicals.

Reference the control measures to be taken if physical contact or airborne exposure occurs.

Reference precautions necessary to prevent exposure including Personal Protective Equipment.

PPE requirements are defined prior to the step when requirements exceed the standard plant PPE (hard hat, safety glasses, personal H2S monitor, fire resistant clothing, and safety toe footwear with defined heel).

HAZARDS OF THE PROCESS

Grounding of Vacuum Truck (will be verified by electrician)

APPLICABLE DOCUMENTS

Safe Upper and Lower Limits tables are troubleshooting guidelines that define Process Limits, Consequences of Deviation, and the steps to avoid or correct the deviation. They are used in conjunction with Operating Procedures to respond to process deviations that have initiated a DCS alarm. Tables are found in the Superior Refinery Information Server (SIS Webpage)

REQUIREMENTS

Process Parameter Limits are defined in the DCS. Both (Advisory) high and low alarms are considered to be operational and do not indicate an emergency condition. (Critical) High/High and Low/Low alarms indicate an emergency condition and require an immediate corrective action.

If required in procedure, upon completion of each step, the operator carrying out the step shall log time & initial indicating completion of the step.

CAUTION: Any changes to content, sequence or step elimination of this procedure requires a Job Safety Review to be completed prior to implementing the change. The review of the task must include all personnel affected and at least 2 other knowledgeable subject matter experts, including Supervision.

CAUTION: An MOC is required if the procedure changes increase the risk of injury to personnel, off site environmental impact or release of Highly Hazardous Chemicals.
In general, an MOC is required if the change to the procedure defeats a shutdown, defeats a PSV, defeats any device meant to protect the unit and associated equipment, or causes exceedance of a mechanical limit, causes exceedance of a safe operating limit or introduces new chemicals to the process.

NOTE: The Shift Supervisor has the authority to approve an MOC in the off-hours and / or in the absence of the Operations manager as necessary.

☐ **N/A** **JOB SAFETY REVIEW OF PROPOSED PROCEDURAL CHANGES:**

1.0 Personnel Participating in the JSR

	Print Name	Job Classification
1.1		
1.2		
1.3		

2.0 Description Of Procedure Change To Be Performed Or Eliminated

3.0 Identify Potential Hazards Associated With Changes to This Procedure

3.1 Exposure To Personnel

☐ Chemical Contact
☐ Thermal Burn
☐ Particles in Eye
☐ Noise
☐ Heat / Cold
☐ Lead / Asbestos
☐ Radiation
☐ Inhalation

3.2 Process Hazards

☐ More Flow
☐ Less Flow
☐ More Pressure
☐ Less Pressure
☐ More Level
☐ Less Level
☐ More Temperature
☐ Less Temperature
☐ Hydraulic Hammer
☐ Flow Surge
☐ Overfilling
☐ Loss of level
☐ Overheating
☐ Over cooling
☐ Pulling Vacuum
☐ Air ingress
☐ Gas ingress
☐ Environmental
☐ Loss of containment

3.3 Fire Hazards

☐ Mixing Chemicals
☐ Fire / Explosion
☐ Spills
☐ Runaway reaction

3.4 Other Hazards

☐ Human Factors
☐ Dropped Objects
☐ Process Interruption in adjacent area

4.0 List And Describe Potential Hazards

5.0 Recommendations To Remove Hazards

NOTE: Use the back side of this sheet if additional space is required.

PROCEDURE:

CAUTION: ANY VALVE POSITION CHANGES MUST BE DOCUMENTED AND TAGGED FOR THE INTEGRITY OF THE INVESTIGATION.

CAUTION: DO NOT MOVE ANY CHEMICAL CLEANING EQUIPMENT/CONNECTIONS WITHOUT PRIOR AUTHORIZATION FROM BILL DEMCHUCK (HUSKY LEAD INVESTIGATOR) OR BILL'S RELIEF.

TIME INITIAL

_____ _____ 1. Connect nitrogen hose to ¾" bleeder on suction side of B-Compressor

_____ _____ 2. Start flowing nitrogen at 2-5 psig at inlet into process.

NOTE: WE ARE TRYING TO ADD ENOUGH NITROGEN TO PREVENT ADDITIONAL AIR INTAKE WHILE DRAINING THE LIQUID OUT OF THE MAIN COLUMN RECEIVER. WE DO NOT WANT TO BUILD SIGNIFICANT BACK PRESSURE AS THAT MY FORCE HYDROCARBONS OUT.

_____ _____ 3. Close all suction valves of the wet gas compressors

1.31 Suction Valve A Compressor

1.32 Suction Valve B Compressor

1.33 Suction Valve C Compressor

_____ _____ 4. Close Block valves on receiver pressure control spill back control valve

NOTE: WE WANT TO PURGE NITROGEN INTO THE TOP OF THE MAIN COLUMN RECEIVER AND NOT THE GAS CON. THAT IS WHY WE ARE ISOLATING THE GAS CON FROM THE MAIN COLUMN

_____ _____ 5. Block in downstream valve and bypass valve on the main column overhead receiver level control valve

_____ _____ 6. Connect vacuum truck hose to Main Column Drain 1 and drain.

_____ _____ 7. Connect fire water to Water Inlet 1

_____ _____ 8. Fill Main Column Overhead Receiver with firewater until a water level can be seen in the Main Column sight glass

NOTE: WE ARE TRYING TO FLOW ALL OF THE HYDROCARBON FROM THE DEAD LEGS IN THE FIRE AFFECTED ZONE BACK TO THE MAIN COLUMN RECIEVER

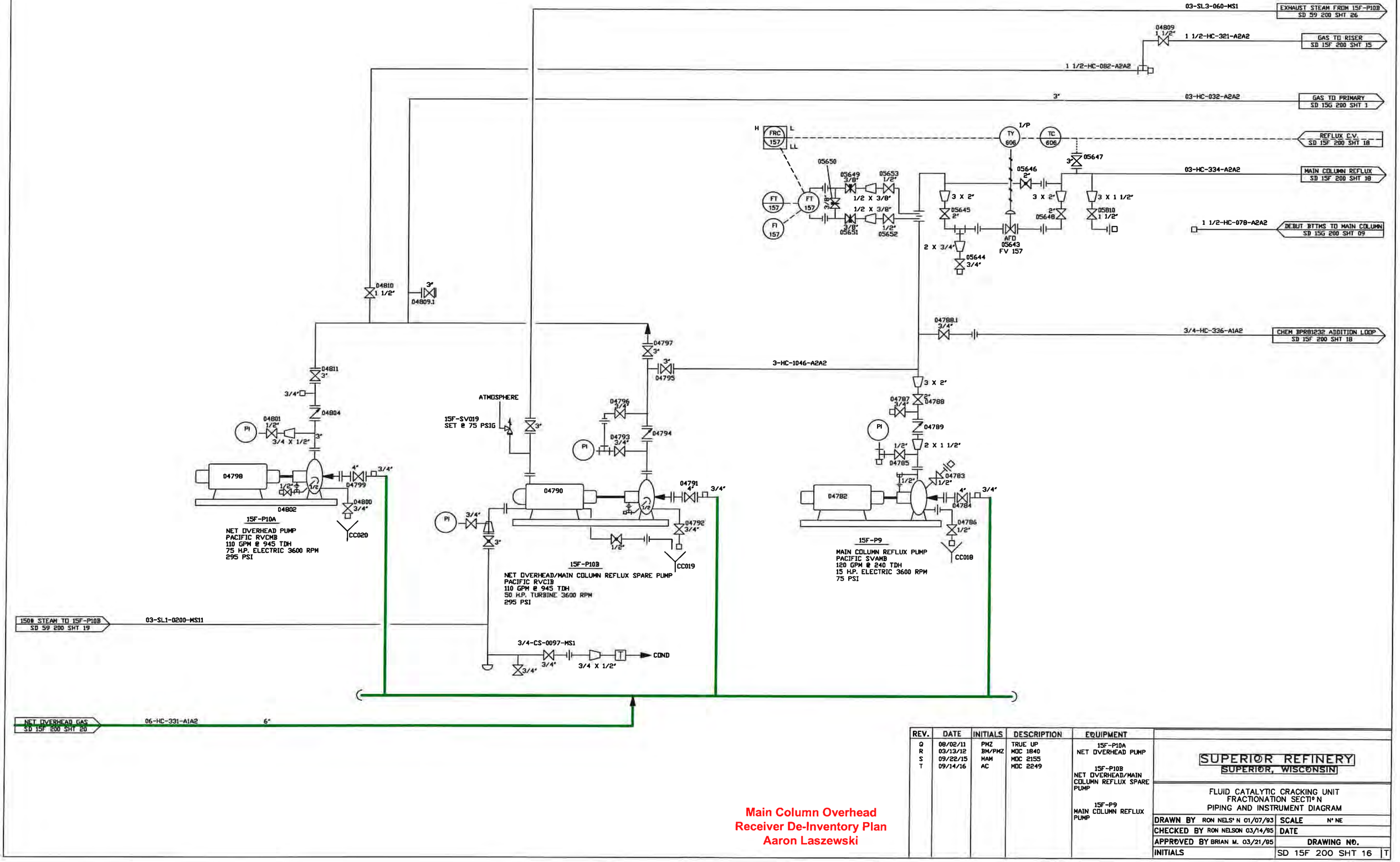
_____ _____ 9. Let the water sit for 1 hour.

NOTE: THIS ONE HOUR WATER PERIOD WOULD BE A GOOD TIME TO HAVE THE VACUUM TRUCK OFFLOAD THE BULK HYDROCARBON TO THE SLOP. THE NEXT VACUUM TRUCK LOAD WILL BE PRIMARILY WATER.

_____ _____ 10. Drain Main Column Drain 1.

_____ _____ 11. Continue nitrogen purge from the wet gas compressors to the main column.

END OF PROCEDURE



REV.	DATE	INITIALS	DESCRIPTION	EQUIPMENT
Q	08/02/11	PMZ	TRUE UP	15F-P10A NET OVERHEAD PUMP
R	03/13/12	BM/PMZ	MDC 1840	
S	09/22/15	MAM	MDC 2155	15F-P10B NET OVERHEAD/MAIN COLUMN REFLUX SPARE PUMP
T	09/14/16	AC	MDC 2249	
				15F-P9 MAIN COLUMN REFLUX PUMP

Main Column Overhead Receiver De-Inventory Plan
Aaron Laszewski

SUPERIOR REFINERY
SUPERIOR, WISCONSIN

FLUID CATALYTIC CRACKING UNIT
FRACTIONATION SECTION
PIPING AND INSTRUMENT DIAGRAM

DRAWN BY RON NELSON 01/07/93	SCALE NONE
CHECKED BY RON NELSON 03/14/95	DATE
APPROVED BY BRIAN M. 03/21/95	DRAWING NO.
INITIALS	SD 15F 200 SHT 16 T

GEAR CASE C/W IN
SD 15G 200 SHT 22

1/2-CWS-065-MS1

1/2"

12-HC-089-A1A2

C COMPRESSOR L.P. SUCTION
SD 15G 200 SHT 18

12-HC-088-A1A2

A COMPRESSOR L.P. SUCTION
SD 15G 200 SHT 16

MAIN COLUMN OVHD RCVR
SD 15F 200 SHT 20

16-HC-087-A1A2

04621
12"

04621.1
1/2"

16 X 12"

16 X 12"

STEAM TO B COMP LP
SD 59 200 SHT 18

3/4-SL1-0351-MS11

RCVR PRESSURE
SD 15F 200 SHT 20

SPILLBACK
SD 15G 200 SHT 15

04-HC-200-A1A2

4 X 3"

4 X 3" 3"

3 X 2"

3 X 2"

4 X 3"

4 X 3"

04458
3"

04457
3"

04460
3/4"

15-PV296
AFO
04456

04459
3"

04462
3/4"

04461
12"

N_2 In

04622.3
3/4"

SUCTION HEATER

3/4"

2 X 3/4"

04623.1
3/4"

3/4"

3/4 X 1/2"

3/4 X 1/2"

CONDENSATE

15G-CIB-V1
1ST STAGE SUCTION SNUBBER
28" OD X 102" OAL
100 PSIG @ 150° F
MATERIAL: SA-516-70

15G-CIB-V2
1ST STAGE DISCHARGE SNUBBER
28" OD X 102" OAL
100 PSIG @ 250° F
MATERIAL: SA-516-70

TI
020

1/2"

2"

2"

15G-CIB-V1
1ST STAGE SUCTION SNUBBER

3/4"

04480

3/4"

04477
1"

1-DR-0023-A1A1

HC-A1A2
DR-A1A1

1 X 3/4"

3/4" 04477.1

3/4" 04477.2

15G-CIB
B GAS COMPRESSOR
1ST STAGE

3/4"
DEAD MAN
VALVE
04477.3

3/4"
DEAD MAN
VALVE
04477.4

3/4 X 1/2"

3/4 X 1/2"

04477.4A
1/2"

CCCB19F

1 X 3/4"

ANTIFOULANT
SD 15G 200 SHT 15

1/2-CI-100-A1A2

1/8"
ORIFICE
04481.01
1/2"

PI
230

1/2"
04481

04474
2"

3 X 2"

3"

1/2"

2"

15G-CIB-V2
1ST STAGE DISCHARGE SNUBBER

2"

3/4" PLUG

TI
021

6"
04473

04472
3/4"

04472.1
3/4"

15G-SV004B
SET @ 100 PSIG 4"

04471

04470
3"

4 X 3"

04469
3/4"

HC-A1A2
FL-A1A1

04623.2

1"
04477.5

1/2"

1/2"

1/2-CWR-055-MS1

GEAR CASE C/W OUT
SD 15G 200 SHT 22

1/2"

1 X 1/4"

TI
22

15G-CIB
B COMPRESSOR MOTOR
H.P: 450
VOLTS: 460
RPM: 1780
PHASE: 3

N
W E
S

REFINERY

06-HC-230-A1A2

B COMPRESSOR L.P. DISCHARGE
SD 15G 200 SHT 13

04-FL-025-A1A1

B COMPRESSOR S.V.
SD 99 200 SHT 8

2ND STAGE S.V.
SD 15G 200 SHT 15

03-FL-025-A1A1

SUCTION DRUM BLOWDOWN DRUM
SD 15G 200 SHT 15

01-FL-0156-A1A1

LEGEND

- MACT VOC-L
- MACT VOC-G
- VOC-L
- VOC-G
- STEAM/WATER
- NATURAL GAS
- NOT IN LDAR PROGRAM

REV.	DATE	INITIALS	DESCRIPTION
J	05/24/00	PMZ	MOC 1155
K	01/18/01	PMZ	MOC 1155/TAGS
L	03/12/02	TJT	MOC 1258
M	06/10/03	PMZ	LDAR
N	01/21/04	PMZ	LDAR
O	01/10/05	PMZ	HAZOP CORR.
P	02/04/08	PMZ	LDAR LEGEND
Q	05/14/09	PMZ	TRUE UP
R	04/23/12	PMZ	CAT COMP. ADDITIVE
S	05/23/14	TM/PJM	MOC 2047
T	11/17/14	MAM	MOC 2155
U	03/12/15	EB/PJM	MOC 2132
	04/02/15	EL/PJM	MOC 2151
V	05/14/15	BM/PJM	MOC 2176
	07/31/15	EB/PJM	MOC 2132

EQUIPMENT
15G-CIB
B GAS COMPRESSOR
1ST STAGE
15G-CIB-V1
1ST STAGE SUCTION
SNUBBER
15G-CIB-V2
1ST STAGE DISCHARGE
SNUBBER

Husky Energy
SUPERIOR REFINERY

FCC GAS CONCENTRATION AND MEROX UNIT
GAS COMPRESSOR SECTION
PIPING AND INSTRUMENT DIAGRAM

DRAWN BY RON NELSON 02/11/93	SCALE NONE
CHECKED BY ED SMITH 03/29/93	DATE
APPROVED BY LYLE LAKE 06/04/93	DRAWING NO.
INITIALS	SD 15G 200 SHEET 14 V

Main Column Receiver
De-Inventory

15F-V15
MAIN COLUMN OVERHEAD RECEIVER
SIZE: 6'-6" I.D. X 26'-8" T-T
RATING: 35 PSIG @ 250 F
CA: .32 SHELL/HEAD
THICKNESS: .250 SHELL/HEAD
MATERIAL: SA-285-C

15F-V15
MAIN COLUMN OVERHEAD RECEIVER

M.C. RCVR PRESSURE
SD 15G 200 SHT 14

M.C RCVR LV.
SD 15G 2'0 SHT 1

MAIN COLUMN OVHD RCVR
SD 15G 200 SHT 14

MAIN COLUMN RCVR RELIEFS
SD 99 200 SHT 8

MC RECEIVER DRY END
SD 15G 200 SHT 13

CONDENSED GASES
SD 15F 200 SHT 19

SPLITTER/STAB FF GAS
SD29 200 SHT 38

NET OVERHEAD GAS
SD 15F 200 SHT 16

FCCU SOUR WATER
SD 43 200 SHT 2

NOTE 1
LONG BOLT FLANGELESS VALVE
WITH GALVANIZED STEEL COVER

15F-P28
WASTE WATER PUMP
DESIGN CAPTY: 40 GPM @ 120 TDH
DRIVER: 5 HP 3505 RPM
SEAL TYPE:
DIFF PSI:

15F-P11
WASTE WATER PUMP
DESIGN CAPTY: 40 GPM @ 120 TDH
DRIVER: 5HP ELECTRIC: 3600 RPM
SEAL TYPE: JOHN CRANE 9 1 1/2"
DIFF PSI: 50 PSI OPER TEMP. 100 F

15F-P24
HYDROCARBON RECOVERY PUMP
3/4 H.P. 1140 RPM

LEGEND
- MACT VOC-L
- MACT VOC-G
- VOC-L
- VOC-G
- STEAM/WATER
- NATURAL GAS
- NOT IN LDAR PROGRAM

REV.	DATE	INITIALS	DESCRIPTION
I	12/14/04	PMZ	LDAR
J	04/18/05	PMZ	MOC 1392 / LDAR
K	04/25/06	PMZ	LDAR
L	12/19/06	PMZ	LDAR
M	06/23/08	PMZ	MOC 1495
N	02/05/09	PMZ	LDAR
O	08/11/11	PMZ	LDAR TRUE UP
P	01/23/12	PMZ	TRUE UP
Q	03/13/12	BM/PMZ	MOC 1840
R	06/21/13	BJM	MOC 1994
S	6/20/14	PJM	MOC 1994 CORRECTION
T	03/12/15	EB/PJM	MOC 2132
U	11/29/16	BM/PJM	MOC 2319

EQUIPMENT
15F-V15
MAIN COLUMN OVERHEAD RECEIVER
15F-11
WASTE WATER PUMP
15F-P24
HYDROCARBON RECOVERY PUMP

SUPERIOR REFINERY
SUPERIOR, WISCONSIN

FLUID CATALYTIC CRACKING UNIT
FRACTIONATION SECTION
PIPING AND INSTRUMENTATION DIAGRAM

DRAWN BY ED SMITH 08/08/94	SCALE NONE
CHECKED BY KEN RIKKOLA	DATE
APPROVED BY BRIAN M.	DRAWING NO.
INITIALS	SD 15F 200 SHT 20 S

Main Column Overhead Receiver De-Inventory Fire Plan

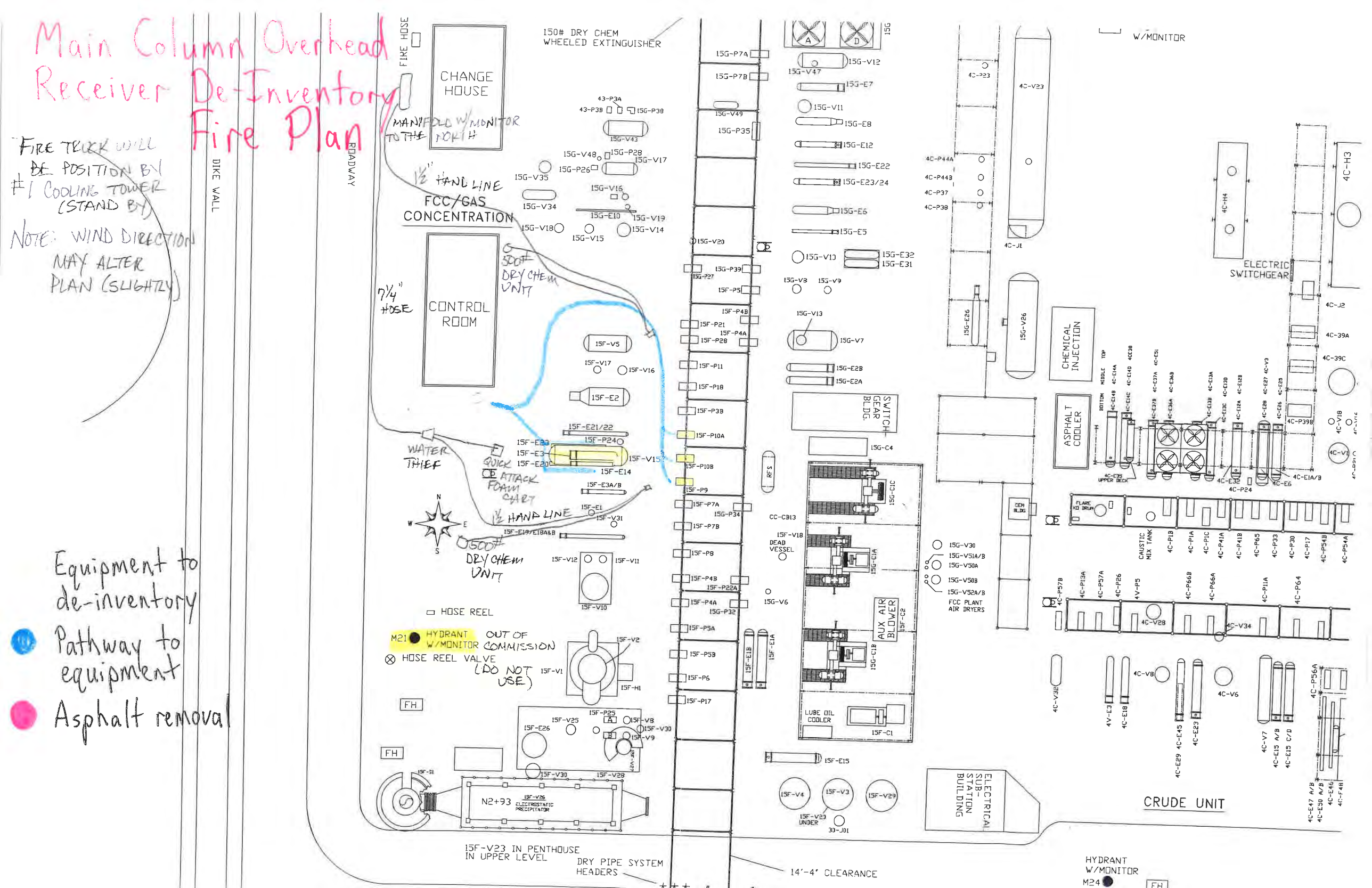
FIRE TRUCK WILL ~~BE~~ POSITION BY #1 COOLING TOWER (STAND BY)

NOTE: WIND DIRECTION MAY ALTER PLAN (SLIGHTLY)

Equipment to de-inventory

Pathway to equipment

Asphalt removal



Main Column Overhead Receiver De-Inventory
(equipment staging/air monitoring)

- additional areaRAE as needed due to wind or west of tank.

- Vac Truck and Connections
- Nitrogen Trailer Connections

DIKE WALL

ROADWAY

areaRAE

Vac Truck

FIRE HOSE

Asbestos sample 5-17-18

CHANGE HOUSE

150# DRY CHEM WHEELED EXTINGUISHER

FCC/GAS CONCENTRATION

CONTROL ROOM

areaRAE

handheld monitors roaming including Benzene

asbestos air sample 5-17-18

asbestos air sample 5-18-18

Asbestos sample 5-17-18

Main Column areaRAE

areaRAE

43-P3A
43-P3B
15G-P38
15G-V43
15G-V48
15G-P28
15G-V17
15G-P26
15G-V35
15G-V16
15G-V34
15G-E10
15G-V19
15G-V18
15G-V15
15G-V14

15G-P7A
15G-P7B
15G-V49
15G-P35
15G-V20
15G-P39
15G-P27
15F-P5
15F-P4B
15F-P21
15F-P4A
15F-P28
15F-P11
15F-P18
15F-P3B
15F-P10A
15F-P10B
15F-P9
15F-P7A
15G-P34
15F-P7B
15F-P8
15F-P4B
15F-P22A
15F-P4A
15G-P32
15F-P5A
15F-P5B
15F-P6
15F-P17

15F-V5
15F-V17
15F-V16
15F-E2
15F-E21/22
15F-P24
15F-E23
15F-E3
15F-E20
15F-V15
15F-E14
15F-E3A/B
15F-E1
15F-V31
15F-E19/E18A&B
15F-V12
15F-V11
15F-V10

15G-V47
15G-V12
15G-E7
15G-V11
15G-E8
15G-E12
15G-E22
15G-E23/24
15G-E6
15G-E5
15G-V10
15G-E32
15G-E31
15G-V8
15G-V9
15G-V13
15G-V7
15G-E28
15G-E2A

SWITCH GEAR BLDG.
15G-C4
15G-C1C
15G-C1A
15G-C1B
AUX AIR BLOWER
15F-C2
15F-C1
LUBE OIL COOLER

RFS
CC-CB13
15F-V18
DEAD VESSEL
15G-V6
15F-E1B
15F-E1A

15F-E15
15F-V4
15F-V3
15F-V29
15F-V20 UNDER
30-J01

15G-V30
15G-V51A/B
15G-V50A
15G-V50B
15G-V52A/B
FCC PLANT AIR DRYERS

CEM BLDG

ELECTRICAL SUB-STATION BUILDING

HOSE REEL
M21 HYDRANT W/MONITOR
HOSE REEL VALVE

15F-V2
15F-V1
15F-H1
FH
15F-P25
15F-V25
15F-E26
15F-V8
15F-V30
15F-V9
15F-V27
15F-S1
15F-V30
15F-V28
N2+93
15F-V26 ELECTROSTATIC PRECIPITATOR

15F-V23 IN PENTHOUSE IN UPPER LEVEL

DRY PIPE SYSTEM HEADERS

14'-4" CLEARANCE

HYDRANT W/MONITOR
M24
FH

W/MONITOR

4C-P23
4C-V23
4C-P44A
4C-P44B
4C-P37
4C-P38
4C-J1
15G-E26
15G-V26

CHEMICAL INJECTION

ASPHALT COOLER

ELECTRIC SWITCHGEAR
4C-H4
4C-H3
4C-J2
4C-39A
4C-39C
4C-P39B
4C-V18
4C-V16
4C-V17
4C-P21C

4C-E35 UPPER DECK
4C-E32
4C-E6
4C-E1A/B
4C-P24

FLARE KO DRUM
CAUSTIC MIX TANK
4C-P1B
4C-P1A
4C-P1C
4C-P41A
4C-P41B
4C-P65
4C-P33
4C-P30
4C-P17
4C-P54B
4C-P54A

4C-P57B
4C-P13A
4C-P57A
4C-P26
4V-P5
4C-V28
4C-P66B
4C-P66A
4C-P11A
4C-P64
4C-V34

4C-V32
4V-E3
4C-E18
4C-V8
4C-V6
4C-E29
4C-E45
4C-E23
4C-V7
4C-E15 A/B
4C-E15 C/D
4C-P56A
4C-E47 A/B
4C-E50 A/B
4C-E46
4C-E48

CRUDE UNIT

5-19-2018

INSPECTION	OVERVIEW	INSPECTION				OVERVIEW	INSPECTION			OVERVIEW	INSPECTION	OVERVIEW	OPERATIONS		OVERVIEW	OPERATIONS		OVERVIEW
Foundation Assessment	Remarks	Ladders / Platforms Assessment	Small Bore Piping Assessment	Electrical Instrumentation Assessment	Insulation Intact? Asbestos?	Remarks	Visible Shell Damage (Yes / No)	Visible Structural Damage (Yes / No)	Visible Product Leaking? (Yes / No)	Remarks	ITP / RR Complete	Remarks	Contains Product? (Yes / No)	Product Level (Enter Level)	Remarks	Still Pressurized? (Yes / No)	Pressure (If Known)	Remarks
15F-V15 Main Column OH Receiver	05/18/2018 10:37 AM (BILL.STRONG) ✓ BS MM	Add Note 05/18/2018 11:48 AM (BILL.STRONG) ✓ Steel cross supports show deformation	05/18/2018 10:37 AM (BILL.STRONG) ✓ BS MM	05/18/2018 10:39 AM (BILL.STRONG) ✓ BS MM	05/18/2018 10:39 AM (BILL.STRONG) ✓ BS MM	05/18/2018 10:52 AM (BILL.STRONG) ✓ BS MM	Add Note	05/18/2018 10:53 AM (BILL.STRONG) ✓ No	05/18/2018 10:53 AM (BILL.STRONG) ✓ Yes	05/18/2018 10:53 AM (BILL.STRONG) ✓ No	Add Note 05/18/2018 11:46 AM (BILL.STRONG) ✓ There is a shallow Dent noted on the NE end of the Vessel	05/18/2018 10:55 AM (BILL.STRONG) ✓ N/A	Add Note 05/18/2018 11:01 AM (BILL.STRONG) ✓ Debris/ Misc tray part on NE corner of platform-picture is on file.	05/19/2018 7:30 AM (HUSKY.FCC) ✓ Assume Yes DK	05/19/2018 7:30 AM (HUSKY.FCC) ✓ Unknown DK	Add Note	05/18/2018 11:28 AM (HUSKY.FCC) ✓ No BM	05/18/2018 11:28 AM (HUSKY.FCC) ✓ N/A	Add Note

HUSKY ENERGY INC.

Waste Management Plan

2018 Superior Refinery Fire

Matt Turner
5/22/2018

Environmental Unit Leader		5-22-2018
	Signature	**Date**
Operations Section Chief		5-22-2018
	Signature	**Date**
Planning Section Chief		22 MAY 18
	Signature	**Date**
Incident Commander		22 May 18
	Signature	**Date**

Contents

1. Objectives

1.1. Stream Identification

A stream requiring management can range from hazardous and non-hazardous wastes to streams in which hydrocarbon can be recovered and re-refined. Once individual streams are identified, it will be paramount to keep them separate from each other. Isolating streams will ensure proper management under this plan, the site-specific Emergency Response Plan, the Incident Action Plan, and the Asbestos Remediation Plan.

1.1.1. Known streams requiring management

- Asbestos Containing Material (ACM)
- Asphalt that is mixed with ACM, debris (metal, insulation etc.), and petroleum impacted soil
- #6 fuel oil and therminol
- Product inventory remaining in units
- Waste generated during field decontamination activities (oily absorbents/PPE and decon water)
- All scoped waste from planned turnaround activities

1.1.2. Potential streams which would require management

- Chemicals from damaged containers (drums, totes, etc.)
- Any discovered or created streams (spills, new/altered work scopes, etc.)

1.2. Stream Storage

1.2.1. Wastes

Streams that are determined to be solid wastes (asphalt, debris, contaminated PPE, non-recoverable products, petroleum impacted soil, oily absorbents, etc.) will be disposed of off-site following DOT regulations as either non-hazardous waste or hazardous waste in accordance with RCRA regulations. Examples of storage containers for wastes include drums, totes, roll-off boxes and vacuum boxes. In accordance with the Asbestos Remediation Plan, all containers of ACM waste shipped off-site will be inspected by the licensed Wisconsin asbestos abatement contractor to ensure that the exteriors are asbestos free.

1.2.2. Recoverable/Recyclable Materials

Streams that are determined to be recyclable will be kept on-site in either a network of frac tanks or in the storage tank system of the facility. Frac tanks can be ordered with or without steam coils depending on what material will be stored inside them. Certain storage tanks (i.e. slop oil tanks) in the facility can also be used for the storage of streams for which hydrocarbons can be recovered but only after consulting with both the Operations Unit and Environmental Unit.

1.2.3. Water Needing Treatment

Due to the fire response efforts, a large amount of water containing firefighting foam compounds is currently present on-site that will ultimately need to be treated through the on-site Waste Water Treatment Plant (WWTP)and a granular activated carbon (GAC) system. This water is currently being stored in Ponds 2/3 & 4, the dike for tanks 106, 112 & 114, inside frac tanks, and inside Tank 45. With

the WWTP and API Separator both operating, any contaminated water can be released at the on-site wash slab for processing and treatment through the API Separator, WWTP and GAC system.

1.3. Stream Management

Once individual streams have been properly identified, the focus will then turn towards their management. All management activities are to be done in accordance with the site-specific Emergency Response Plan, the Incident Action Plan, and the Asbestos Remediation Plan. Stream management will be done on a task-specific basis in conjunction with the Operations Section, the Environmental Unit, and the Wisconsin Licensed Asbestos Abatement Contractor as necessary. Barr Engineering and GHD will coordinate the documentation of any waste disposal that occurs.

All wastes will be transported off-site according to DOT and RCRA regulations. All hazardous wastes will be disposed of at a permitted TSDF in accordance with RCRA regulations.

Streams in which hydrocarbon can be recovered are to be managed along the following guidelines:

- Slop oil tanks and frac tanks with steam coils can be used for materials to re-refined onsite
    - Flare KO material, recovered #6 fuel oil, gas oil, LCO, process de-inventory, etc.
- Frac tanks without steam coils for materials that do not require heating
    - Gasoline and diesel range products
- Tanker trucks to move material directly from the site to an off-site facility for recovery and treatment

2. Contact Information

- Waste Management Task Force Leader: Matt Turner
- Environmental Unit Leader: Dave Beattie
- Waste Water Treatment Plant Superintendent: Joe Amato
- Wisconsin Licensed Asbestos Abatement Contractors: In-Line Construction & Brandenburg

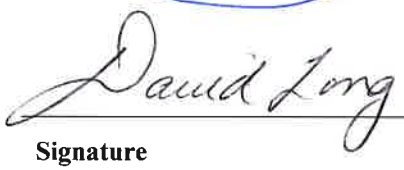
ERROR: cannot process PDF document 'Community Air Monitoring Reduction Plan.pdf'

HUSKY ENERGY INC.

Community Soot Assessment Work Plan

2018 Superior Refinery Fire

David Beattie
5/22/2018

Environmental Unit Leader		5-22-2018
	Signature	**Date**
Operations Section Chief		5-22-2018
	Signature	**Date**
Planning Section Chief		22 MAY 18
	Signature	**Date**
Incident Commander		2018/05/22
	Signature	**Date**

Community Soot Assessment Work Plan
2018 Superior Refinery Fire

Objective:

- Assess the potential deposition of soot from the fire within the surrounding community.

Approach:

- Assess property surrounding the refinery for presence/absence of soot deposition in amounts that can be visually observed, paying particular attention to flat surfaces in the area south and west of the refinery which were identified as being located downwind of the fire.
- Review visual soot assessment information generated by GHD and USEPA community monitoring teams to determine if there are any areas of visual soot deposition i) within the study area, ii) in residential/commercial/agricultural areas, iii) in locations identified through community contacts, and iv) not believed to be associated with other sources.
- Assess the need for additional steps to evaluate the potential for adverse human health effects based on the results of the above activities.

Procedure:

- Community monitoring teams will look for the presence of visible soot within the community and surrounding property as they are conducting community air quality monitoring. Observations of soot absence or presence will be made and recorded at some of the community air monitoring points with vehicles stopped (discrete soot assessment locations). While driving, crews will look for visible soot deposition throughout the community and surrounding land areas; if any visible soot is observed while traveling, the crews will stop, make further assessments, and record the observation(s). Monitoring teams will also attend locations if alerted to specific potential soot deposition by Husky through the 24-hour residents' line or through other means.
- Documentation of soot presence or absence at discrete soot assessment locations will be made using GHD's tablet data collection system. Data records will either be made as text comments on the air quality data record or as site observation records.
- Observations will also be made in areas that were not downwind during the fire to assess background soot deposition in the community and surrounding land areas, with a focus on specific depositional areas that correspond to depositional areas in the downwind areas (i.e., adjacent to roads, adjacent to rail, etc.).
- A GHD Certified Industrial Hygienist (CIH) will review the visual soot assessment information and make a determination on the potential follow-up assessment and procedures as well as the potential for adverse human health effects.
- If warranted, GHD's CIH will make recommendations for procedures to assess potential exposures to soot.